Health research as news in South Africa: measuring the quality of health journalism at six daily newspapers

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ABSTRACT

Quantitative analysis of reporting on new medical research by six South African newspapers

The media are extremely influential in shaping public opinion about various issues. News reports on new medical research have the potential to impact on people's health – not only by influencing individual behaviour, but also by informing health professionals and policy-makers about new medical findings.

This study measured the standard of news reports on new medical research that were published in six daily newspapers in South Africa during 2014.

Using a rating model developed by Health Media Review and based on ten criteria that characterise a good health news report, every relevant article published in that period was analysed and rated. The ratings of individual articles were combined to determine an average rating for each newspaper. Averages for each criterion highlighted the strengths and weaknesses of each newspaper's reporting on new medical research.

Additional information about the number, placement and origin of articles was also collected and provided insight into the value newspapers attach to reports on new medical research.

The findings indicated that although the average scores varied widely between individual newspapers, definitive trends in high and low scoring criteria applied to all the publications. In other words, newspapers displayed similar strengths and weaknesses for certain criteria and there were definitive areas in which all newspapers either scored very well or fared poorly.

In general the assessed newspapers fared well regarding some very important basic principles of science reporting, such as grasping the quality of evidence and avoiding disease mongering, but much more can be done to improve the standard of reporting on new medical research. The research indicated that journalists should engage more critically with new research by highlighting the benefits as well as the risks of a new medication or technology, adding comment from independent sources and ensuring that they only report on peer-reviewed research. Journalists should also do more to inform readers about the accessibility and true value of new research by discussing availability and costs and benchmarking it against other therapies.

ABSTRAK

'n Kwantitatiewe ontleding van verslaggewing oor nuwe mediese navorsing deur ses Suid-Afrikaanse koerante

Die media is ontsaglik invloedryk wat openbare meningsvorming oor verskeie kwessies betref. Verslaggewing oor nuwe mediese navorsing kan 'n impak op mense se gesondheid hê – nie net deur individuele gedrag te beïnvloed nie, maar ook deur nuwe mediese bevindings aan gesondheidsdeskundiges en beleidmakers bekend te stel.

Hierdie studie meet die standaard van beriggewing oor nuwe mediese navorsing wat gedurende 2014 in ses Suid-Afrikaanse dagblaaie gepubliseer is.

Deur middel van 'n takseringsmodel wat deur Health Media Review ontwikkel is en gegrond is op 10 kriteria wat 'n goeie gesondheidsartikel kenmerk, is elke artikel wat gedurende daardie tydperk gepubliseer is, ontleed en beoordeel. Die waarde van individuele artikels is saamgevoeg om 'n gemiddelde waarde vir elke koerant te bepaal. Die gemiddeld van elke kriterium het die sterk- en swakpunte van beriggewing oor nuwe mediese navorsing by elke koerant blootgelê.

Bykomende inligting oor die getal, plasing en oorsprong van die artikels is ook ingesamel en het insae gebied in die waarde wat elke koerant aan beriggewing oor nuwe mediese navorsing heg.

Die bevindings het getoon dat ofskoon daar groot verskille tussen die gemiddelde waardes van die individuele koerante was, besliste tendense van hoë en lae tellings vir sekere kriteria op al die publikasies van toepassing was. Met ander woorde, die koerante het soortgelyke sterk- en swakpunte getoon wat sekere kriteria betref en daar was besliste areas waar alle koerante óf baie goed, óf swak gevaar het.

Die koerante wat ontleed is, het oor die algemeen goed gevaar betreffende 'n paar baie belangrike basiese beginsels van wetenskapsverslaggewing, soos om die gehalte van die bewyse te begryp en siekte-oordrywing te vermy, maar daar kan nog baie gedoen word om die standaard van beriggewing oor nuwe mediese navorsing te verbeter. Die navorsing het getoon dat joernaliste navorsing meer krities moet beoordeel deur die voordele én die risiko's van 'n nuwe medikasie of tegnologie uit te lig, kommentaar van onafhanklike bronne te bekom en slegs verslag te doen oor navorsing wat eweknie-beoordeling ondergaan het. Joernaliste moet ook meer doen om lesers in te lig oor die toeganklikheid en waarde van nuwe navorsing deur die beskikbaarheid en koste daarvan te noem en dit teen ander terapieë te meet.

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CHAPTER 1 – INTRODUCTION

This study is concerned with the standard of science/medical journalism that was published in six daily newspapers in South Africa between 1 January 2014 and 31 December 2014. Medical/health journalism is defined as professional journalists reporting on health and medical stories and health-related topics in the mass media (Levi, 2001:4).

This study into the standard of health journalism was undertaken because of the particular importance of health journalism and its potential impact on people's health and wellbeing. It is well known that the media are enormously influential in shaping public opinion about various issues, including health (Leask *et al.* 2010:1), and that most people first learn about developments in science and medicine through the media (Shuchman & Wilkes, 1997:976).

In fact, this influence stretches further than just the general public – doctors and other health care workers, scientists and policymakers also get much of their information about health from reports by professional journalists (Levi, 2001:4). To substantiate, Levi (2001:4) argues that:

> "… [health journalism] not only influences awareness, attitudes, and intentions but may also contribute to changes in behaviour, health care utilization, clinical practices, and health policies."

Health messages reported in the mass media – print, television, radio and internet – therefore not only have the potential to influence the opinions and behaviour of the lay public, but also those of clinicians and other health care staff, as well as health policymakers (Dentzer, 2009:1; Entwistle, 1995:920).

For this reason the media play a very important role in informing the public of new research or developments in the health sector that may have bearing on their lives (Fourie, 2003:1).

Baleta (2006:2) argues that the media have a great influence on the formation of public health policy and the public's knowledge and opinion about health science. She maintains that information and advice written by journalists can result in people changing their behaviour which in turn can have a beneficial or negative impact on their health and welfare. "The power of the media is such that lives can be saved or lost depending on the information that is disseminated" (Baleta, 2006:2).

Fourie (2003:9), whose research focused on the role the South African media played in educating the public about the HIV/AIDS epidemic, said that the media not only contributed to the public's knowledge about the disease, but was instrumental in forming the public's opinion and reaction to people living with HIV/AIDS.

> "In die proses versterk hierdie beriggewing soms vrese en vyandigheid terwyl dit ander kere akkurate en nuttige analises gee" (Fourie, 2003:9).

With the emergence of AIDS in the early 1980s, the disease was labelled a "gay plague" in the South African media causing the government of the time, under whose rule homosexuality was also illegal, to pay no attention to, and make no attempt to prevent or treat the disease, until much later when it had progressed into a full-blown epidemic (Geffen, 2010:16-18).

In effect, news reports on health issues could therefore have an influence on patients' health outcomes, as well as patients' and the public's views on the disease, which makes it particularly important that journalists get it right, as inaccurate reporting can generate false hopes or unwarranted fears (Shuchman & Wilkes, 1997:976). This highlights the media's responsibility to pay particular attention to ethics in the practice of medical reporting.

But reporting on health is not always an easy task – journalists often have to process complex scientific data and statistics, and report it in a way that is understandable and accessible to the public (Fourie, 2003:1; Blastland & Dilnot, 2007:6-11; Cohn & Cope, 2012: Kindle location 301).

Low (2003:27) argues that although the public can generally make allowances for the way news is reported, in the case of science, few people possess the necessary understanding of the working of science to draw the right conclusions (Claassen, 2011: 357).

Ironically, more often than not, health news stories are compiled by reporters without any particular training in, or knowledge of, health issues (Levi, 2001:5). At many newspapers or news agencies journalists have to cover a variety of news, for example, sports, crime and politics, and at those media institutions where journalists are given dedicated "beats", health is often clumped along with general science reporting which includes a wide array of issues, including topics like climate change, environmental issues and astronomy (Claassen, 2011: 353; Nelkin, 1995:73), each requiring a vastly different body of knowledge and understanding.

Levi (2001:5) comments:

> "In many media, general reporters cover not only politics, crime, wars, disasters, business, and national budget issues. They are also expected to report on everything from the latest findings in genetic research and molecular biology to what new drugs are good for, how infectious diseases spread, and when women should be screened for breast cancer."

This is also the case in South Africa where Claassen (2011:352) found that only one South African newspaper has a formal science desk managed by a designated science editor with a team of science journalists. Other media outlets rely on generalist journalists, or journalists assigned to other 'beats' to report on science too.

It is therefore no wonder that all too frequently the health-related messages delivered by the mainstream media are inaccurate or misleading (Dentzer, 2009:1). Entwistle (1995:920) and Leask *et al.* (2010:1-2) also maintain that new medical research is often misinterpreted or misrepresented in the lay media.

A survey of South African researchers' opinion of the quality of science reporting, which includes medical news, revealed that standards in South Africa are not considered to be very high (Claassen, 2011:351).

Leask *et al.* (2010:1-2) explains that inaccuracies are often caused by sensationalist reporting or through omission of relevant information. While reporting on new medical research, journalists also ignore complexities or fail to provide context which would place the new scientific findings in a different light (Dentzer, 2009:1).

Low (2003:2) highlighted a critical issue that it is particularly difficult, especially for journalists without any formal health or scientific training, to distinguish between more reliable science and less reliable science.

Each of the above issues will be discussed at length in Chapter 2 as they form the basis for my inquiry into the standard of health journalism at six daily newspapers in South Africa over the specified period.

The impetus for this paper was drawn from the American health news watchdog, Health News Review, which reviews news articles about medical treatments that appear in the popular media and assesses their quality using a standardised rating scale. Their reviews of good and bad examples of news reports are then published on their website www.healthnewsreview.org (Health News Review, 2015).

The primary aim of Health News Review is to improve the standard of health journalism, particularly media coverage focusing on new medicines and treatments in the United States (Health News Review, 2015). These assessments provide valuable insight into the strengths and weaknesses of health reporting in that particular country; however this data cannot be extrapolated to the South African context. Hence this study applied the Health News Review model to local news reports on new medical research to establish the standard of health journalism here, in order to identify the strengths and weaknesses of local reporters in this genre of news.

1.1 Research question

The aim of this research paper therefore is to analyse health news articles specifically pertaining to new medical research at six daily newspapers in South Africa to determine the standard of these reports, identify potential shortcomings, and suggest possible reformative steps that can be taken to improve the quality of health journalism at these newspapers.

The research questions this study intends to answer is:

- What is the standard of health journalism at six South African daily newspapers when reporting on new medical research?
- What are the most common mistakes in these reports?
- What steps can be taken to improve the standard of health journalism at these newspapers?

1.2 Theoretical framework

The study explores the standard of health journalism at six daily newspapers in South Africa, and is concerned with the accuracy of information related to new medical research that is presented to the public. Health news articles carry a highly-ethical burden as they have the potential to influence people's health and wellbeing – they can motivate people to change their health behaviour or create hope (Leask *et al.* 2010:1; Shuchman & Wilkes, 1997:976). Therefore media ethics, and specifically the social responsibility theory is the central theme to this study. Here follows a brief introduction to the topic of ethics, which will also be discussed at length in Chapter 3.

Ethics originated from ancient Greek philosophy (Oosthuizen, 2002:10) and focuses on what is good, acceptable and proper in society, and what is not (Oosthuizen, 2002:5).

Philosophical ethics are divided into two fields: meta-ethics, which is devoted to the evaluation of ethical theories; and normative ethics, which looks at what people ought to do in different situations or how they should conduct their lives (Oosthuizen 2002:12). This study is concerned with the normative ethics of media work and examines the standard of health news at six daily newspapers.

Ethics in the media developed because of journalism's enormous influence on society that makes it important to be practiced in an accountable and responsible way (Retief 2002:5). This branch of the philosophy of ethics deals with what is morally permissible for media workers to do, and what is not (Oosthuizen, 2002:12). Ethical principles were developed to assist media workers to determine what is right and how to choose the best course of action from several alternatives (Oosthuizen, 2002:11).

Social responsibility theory is based on propositions about the needs of (democratic) society (McQuail, 2005:567). It comprises the unwritten obligations implicit in the freedom of publication as well as general ethical and moral principles relating to truth and justice, which will be discussed at length in Chapter 3.

1.3 Research methodology

The study aims to examine the quality of health journalism at six daily newspapers in South Africa. It focuses particularly on new medical research presented in these publications, in order to determine how accurate research data was interpreted by the journalist, and whether it was presented in the right context. The relevance of this study is based on the potential impact health news articles may have on the public's health and wellbeing, which makes it particularly important to report accurately and truthfully.

This study was conducted following a quantitative approach, using the content analysis research methodology.

According to Mouton (2005:165) a content analysis evaluates the content of text, documents and in this instance newspaper articles.

Content analysis is a research method for the objective, systematic and quantitative description of the content of communication. It measures the amount of something (in this case the criteria of a good health news article) in a selected sample of mass media communication (Du Plooy, 1997:152).

The six daily newspapers examined for this research are: *Die Burger*, *Business Day*, *Cape Argus*, *Cape Times*, *The New Age* and *The Times*. News articles focusing on new medical research during the 12-month period, 1 January 2014 to 31 December 2014 were included in the study.

Each article was compared against a list of 10 criteria of what constitutes a good health news article. The criteria were drawn from the rating system used in Health Media Review to rate health news reports. Each article was then assigned a rating out of 10 – zero indicating very poor and 10 indicating excellent – which signify the standard of health journalism applied in the article.

The ratings from the individual articles were combined to form an average rating for each newspaper. These averages where again combined to form an average rating for the six newspapers studied. Averages were also obtained for each criterion enabling the researcher to identify strengths and weaknesses in the reporting of new medical research at each newspaper.

Using this measuring system, it is also possible to identify areas where the news reports scored particularly poorly or well, and from there make recommendations of how to improve the standard of health reporting at the various publications.

1.4 Outline of the study

The chapter outline for the rest of the study is as follows:

In Chapter 1, the motivation for the research is discussed and an outline of the study – its aims, theoretical framework, and methodology – is provided.

Chapter 2 provides a comprehensive literature review explaining the scientific issues and journalistic challenges influencing news reporting on new medical research.

Chapter 3 provides an analysis of the theoretical framework of the study, namely ethics, particularly focusing on the social responsibility theory.

The research methodology and design – a quantitative study using the methodology of content analysis for the gathering of data – are discussed in Chapter 4.

The findings derived from the data collected through this study are elaborated on in Chapter 5.

Chapter 6 concludes the study. The findings are analysed and discussed and recommendations are made to improve the standard of reporting on new medical research at the six newspapers analysed.

A complete list of references used in the study is provided in Chapter 7.

1.5 Summary

The impetus for this study is derived from the importance of responsible health reporting, due to the potential influence it might have on readers' lives. This chapter discussed the power that health reporting has over the health-related behaviour of the general public, as well as doctors and other health care workers, and briefly touched on some of the more common errors made in the practice of medical journalism. An overview of this study, including its aims, theoretical framework and research methodology, was also provided. The scientific method will be discussed in the following chapter, and some of the common mistakes that journalists make while reporting on new medical research will be scrutinised. Finally some of the earlier research on health reporting done in South Africa, which mainly focused on the media's handling of the HIV/AIDS epidemic, will also be discussed.

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

The importance of good health reporting, discussed in Chapter 1, provides the impetus for this study. While a brief overview of the theoretical framework and methodology of the study was also provided in the previous section, this chapter will look at the scientific method, and highlight some of the common pitfalls for journalists reporting on science, and in particular new medical research. Lastly, this chapter will discuss some of the earlier research on medical reporting in the country.

Scientific developments can make our lives easier and help us make better, more informed choices in many spheres of our lives, including our health. For this reason, everyday people – and not just scientists – benefit from having knowledge of science and new scientific developments (Nelkin, 1995:3).

The vast majority of people learn about new scientific and technological advancement through the lay media, and their knowledge, opinions and behaviour towards science are shaped by the journalists reporting the news (Nelkin, 1995:3).

According to Pigliucci (2010:88), the news media play a crucial role in educating the public, "mediating between the decision makers and experts on the one side and the everyday women and men that make up the fabric of our society on the other".

Many people also rely on the news media for information on how to keep healthy (Nelkin, 1995:68). A 1984 survey by the National Cancer Institute in America found that 63.6% of people get information about cancer prevention from magazines, 60% from newspapers, 58.3% from television, and only 13% to 15% had spoken to their doctors about cancer prevention (Nelkin, 1995:68).

A 2012 survey by the Pew Research Centre (2013) showed that the large majority of people now use the internet to access health information.

> "72% of internet users say they looked online for health information within the past year… The most commonly-researched topics are specific diseases or conditions; treatments or procedures; and [contact details for] doctors or other health professionals" (Pew Research Centre, 2013).

This illustrates a heavy reliance on the media for health information. For this reason it is important that news reports on science, and particularly medical science, be truthful and balanced, as they have the potential to influence people's health and wellbeing (Dentzer, 2009:1; Entwistle, 1995:920).

> "Good reporting can enhance the public's ability to evaluate science policy issues and the individual's ability to make rational personal choices; poor reporting can mislead and

> disempower a public that is increasingly affected by science and technology and by decisions determined by technical expertise" (Nelkin, 1995:2).

This role of the media is especially important with health journalism, as inaccurate reporting on new medical research could encourage people to undergo treatment that is ineffective or even harmful, make them stop using treatments that are effective, give them false hope of a cure, and unnecessarily cost users a lot of money (Offit, 2013:Kindle location 2843).

> "If we paint an experimental medical treatment too brightly, the public is given false hope. If we are overly critical of some drug that lots of people take, people may avoid a treatment that could help them, maybe even save their lives" (Cohn & Cope, 2012:Kindle location 301).

The media's influence stretches further than just the general public, it also reaches government officials and influences policy makers (Nelkin, 1995:8, 73). "…they [journalists] stimulate demand for accountability, forcing policymakers to justify themselves to a larger public… they [journalists] help to create the judgmental biases that underlie public policy" (Nelkin 1995:73).

But according to various informed sources, journalists don't always succeed in conveying new medical research in an accurate or responsible manner. Goldacre (2009:x) criticises the media for its reporting in this field: "…we get our information from the very people [journalists] who have repeatedly demonstrated themselves to be incapable of reading, interpreting and bearing reliable witness to the scientific evidence."

These errors may occur for a number of reasons. Often health news stories are compiled by journalists with no training or experience in health reporting or science (Levi, 2001:5). This results in research often being misinterpreted or misrepresented in the lay media due to a lack of understanding of the scientific method.

In a survey of the South African media, Claassen (2011:352) found that science reporting was not highly regarded by scientists and only one news outlet in the country at the time of the study had a formal science desk, staffed with a science editor and trained science writers. This has changed to two news outlets since 2011. But in 2014, the weekly *Mail & Guardian's* science desk was closed again, leaving only *Business Day* with a formal science desk structure at a South African newspaper at the time of writing.

Nelkin (1995:94) maintains that although there is a small cadre of journalists trained in science (including health) reporting, the majority of journalists covering science are in fact generalist reporters, that only cover science part time along with other beats, such as crime, education or sport. "These generalists often find the science beat confusing. Afraid of technical complexity, they are apt to avoid

substantive questions. And lacking both training and experience, they are often unable to evaluate what they are told."

2.2 Background

2.2.1 The scientific method

Many mistakes health journalists make are related to a poor understanding of how science works.

It is widely believed that the essence of science is its method and Bauer (1994:19) describes the scientific method as follows:

> "[It] is a systematic, controlled observation or experiment whose results lead to hypotheses, which are found valid or invalid through further work, leading to theories that are reliable because they were arrived at with initial open-mindedness and continual critical scepticism."

Simply put, the scientific method requires an experiment or test to be repeated and confirmed by others before the results are accepted as true—and even then scientists may change their mind about it at a later date if new evidence comes to light.

Cohn & Cope (2012: Kindle location 407) state that science often contradicts itself. Different researchers may come up with different results on the same subject, or a procedure or product (such as medication) that was initially thought to be safe and effective, may be pulled from the market when new scientific evidence shows the contrary. "To some people, all this changing and questioning gives science a bad name. Actually, it's science working just as it is supposed to work" (Cohn & Cope, 2012: Kindle Location 407).

The reason for the continuous testing and confirmation of work is because scientists understand that methods of observation and experiment are imperfect. "There may be weaknesses, often unavoidable ones, in the way a study is designed or conducted … all scientific investigations require confirmation, and until it is forthcoming, all results, no matter how sound they may seem, are preliminary" (Cohn & Cope, 2012: Kindle Location 469). Only when multiple studies reach the same conclusion, confidence in the results grow and it becomes accepted as theory.

It is essential that journalists reporting on new research understand that science is almost always uncertain, as ideas and concepts are continuously retested. When reporting the results of a new study, it is the duty of the health journalist to convey the results as preliminary and not to report it as fact.

> "When it comes to almost anything we say, you, the reporter, must realize – and must help the public understand – that we are almost always dealing with an element of uncertainty" (Dr

> Arnold Relman, former editor of the *New England Journal of Medicine*, quoted in Cohn & Cope, 2012:Kindle location 451).

In order for studies to be tested, scrutinised and repeated by other scientists, the work, including the methods of how the research was performed, have to be published in peer-reviewed scientific journals. Research that has not been published cannot be considered sound science.

A common mistake by medical journalists is to report on studies that have not been published in peer reviewed journals. An important example of this was when from 2002 to 2006, journalists in the UK repeatedly reported so-called "scientific evidence" that linked the measles, mumps and rubella (MMR) vaccine to autism. Most of this "evidence" was never published in scientific peer reviewed journals, and the one study that was, was later retracted by the journal (Wakefield *et al*, 1998).

The media attention given to these unproven reports resulted in many parents refusing to have their children vaccinated, creating a real public health issue that continues today (Goldacre, 2009:316-319). (See section 2.3.2.)

A poor understanding of the scientific method can also result in journalists confusing anecdotes from a couple of people as proof/evidence that a treatment or product works. Levi (2001:63) explains:

> "Anecdotes breathe life into medical stories, create empathy, and help the audience understand an individual patient's situation. Although single cases may *illustrate* the effects of a treatment, anecdotes should never be portrayed as *evidence*. The journalist must actively help the audience understand that high-powered scientific studies, such as many large randomized clinical trials, are the only way to get reliable and generally applicable results when it comes to measuring and comparing the effectiveness of different treatments."

2.2.2 Textbook vs frontier science

Better knowledge of how science works can also help journalists identify the importance of a new scientific finding.

Even research that has been published in scientific journals is not necessarily accurate and it often happens that "today's discovery turns out to be tomorrow's error" (Bauer, 1994:32). This leads us to another important concept for journalists reporting on science to grasp: the difference between "frontier" and "textbook" science.

Scientific findings that have been retested and confirmed through multiple studies, and which are generally accepted as accurate, are referred to as "textbook" science. New scientific research that still needs to be replicated and confirmed, is called "frontier" science (Bauer, 1994:11).

> "At the frontier of science, where research is pushing to acquire new understanding, there are ideas and hunches, probabilities and possibilities, and beliefs and supposed facts that often melt away as research continues. At the frontier there is new knowledge, but it is fragile, untested, fallible knowledge, by contrast to the long-established, well-tested knowledge of the textbooks" (Bauer, 1994:11).

Bauer argues that in everyday life, frontier- and textbook science are both commonly referred to as "science", but they are "as different from one another as any two things can be, within the bounds that both are guesses about the nature of the real world" (Bauer, 1994:32). Textbook science is generally agreed to by almost all the experts and is unlikely to need to be altered in the future. By contrast, frontier science is very unreliable, and is often disputed by the experts.

Reporters often portray information that appears in scientific journals as undisputed facts, but most papers published in peer-review journals are based on new research that belongs in the category of frontier science. Bauer (1994:47) warns that even published research cannot be considered to be scientific knowledge and that it is just information that has been made widely available. If it is of interest to other scientists, it will be used and tested in further research. If they find something inadequate or wrong, it will be made known, and therefore any piece of scientific work that becomes widely cited is unlikely to be fraudulent or have obvious mistakes. Only work that was regarded as interesting, useful and not overtly wrong becomes incorporated in the secondary literature of review articles and eventually also textbooks.

Nelkin (1995:165) argues that for scientists, research findings are tentative and provisional—and therefore not newsworthy—until certified by peers to fit into the existing framework of knowledge. However, for journalists, certified and established ideas are "old news" and are of far less interest than fresh and dramatic, though possibly tentative, research. Seeking to entertain as well as to inform, journalists are attracted to non-routine, unconventional, and even aberrant events.

Therefore the existing trend in the media is to not report on the tested and reliable textbook science, but rather the latest research, which has not run the gauntlet of scientific testing. Unfortunately most health reporters fail to realise that frontier science is not yet regarded as undisputed fact, and therefore present it to their audiences without the necessary caution or disclosures about its potential inaccuracy or that these are just preliminary results (Bauer, 1994:103).

> "Magazines, newspapers, and television have little interest in textbook science; only the newest and latest is their grist. What they cover is frontier science, capriciously unreliable and fraught with often unsavoury 'personal-interest' attributes; but they cover it under the label 'science', which to them, as to the rest of us, connotes objectivity, reliability, and the scientific method" (Bauer, 1994:114).

In the media's defence, Adelmann-Grill, Waksman and Kreutzberg (1995:2) acknowledge that the public is "not much interested in textbook science but in frontier science", thereby encouraging journalists to cover breaking rather than established science.

Bauer (1994:114) also warns that while the audience understands what is going on with many other subjects and can draw their own conclusions from personal experience or common sense about the accuracy or importance of an article, on matters of science, most people lack the technical background to make allowances for the media's biases (Bauer, 1994:114).

2.2.3 Good vs bad clinical trials

A further complicating factor for journalists reporting on new research is that the results from all scientific studies are not equally relevant or accurate.

There may be several reasons for this: for example a study may have been poorly designed, or research methods might not have been followed correctly, and even in cases where the study was well conducted, the sample may have been so small that the results cannot be reliably extrapolated to the wider population.

Various practices by the pharmaceutical industry also compromise the quality and accuracy of the data that gets published in the academic literature (Goldacre, 2012:1-18). Studies looking at medical research found that an exorbitant number of trials sponsored by drug companies had positive results, especially compared to non-industry funded studies in the same categories (Goldacre, 2012:1-4). The major reason for this, Goldacre argues, is that trials showing unfavourable results often get scrapped, or the results are never published in the academic literature, therefore withholding valuable information about the efficacy and safety of a treatment.

Not only are negative trial results withheld by the industry, but often academic journals are unwilling to publish negative results, or studies replicating other research are excluded (Goldacre, 2012:30-32).

> "Fluke findings… are more likely to be submitted to journals – and more likely to be published – than boring, negative ones" (Goldacre, 2012:32 quoting the authors of a 2012 article in the

journal *Nature* that were unable to replicate the results of 47 of 53 trials on possible new cancer treatments).

The majority of medical research is conducted through clinical trials – scientific tests designed to study the safety or efficacy of a specific method of treatment, or to determine the risk associated with certain exposures. Certain trial designs are more effective at testing certain questions, and some trial designs are considered to be more thorough and accurate than others (Levi, 2001:39).

According to Levi (2001:43), the best source of evidence on the effectiveness of a treatment is a meta-analysis of the results from randomised control trials. Cohort studies typically deliver the best evidence on risk factors, while the best source for a diagnostic test is a blinded comparison against a control group. He also recommends several criteria journalists can use to determine the strength of a clinical trial:

- Prospective studies are preferable to retrospective studies
- Controlled studies are preferable to uncontrolled studies
- Randomised studies are preferable to nonrandomised ones
- Large studies (i.e. those including many subjects) are preferable to small ones, because as the number of cases increase, so does the probable accuracy of a conclusion. Conversely, the smaller the number of observations, the less likely it is that the conclusion is valid.
- Contemporaneous controls (control groups investigated at the same time as those not acting as controls) are preferable to historical controls.
- Blinded studies are preferable to unblinded studies.

This was a brief overview of some the challenges journalists grapple with while reporting on scientific research. In the next section the common mistakes journalists make while reporting on medical issues will be discussed in depth. These errors include: a poor understanding of the scientific method; sensationalising new research; misinterpreting research results; portraying frontier science as textbook science; promoting pseudoscience; and grouping alternative medicine together with allopathic medicine.

2.3 Common mistakes journalists make

2.3.1 Sensationalist reporting

> "Often selection of stories depend more on the potential for drama than the actual seriousness of risk" (Nelkin, 1995:47).

In order to attract more readers or convince editors of the importance of a story, journalists sensationalise scientific findings (Shuchman & Wilkes, 1997:976). This is done by emphasising the uniqueness of individual events (a "first discovery" or "major breakthrough") or applying findings from a small study to a larger population (Nelkin, 1996:160). This sort of reporting has its roots in newsroom pressures to dramatise stories by sounding alarms or touting cures and results that mislead the public about the implications/importance of a finding.

Preliminary research are sometimes framed by the media as a breakthrough or cure, when in fact the study merely elucidated new information on the topic. Nelkin (1995: 132) gives the example of the results of a very small trial (four patients) in 1984 that was presented by the media as a cure for Alzheimer's disease. These reports created false hope in patients, who flocked to the research centre for the treatment that actually turned out to be ineffective.

Levi (2001:79) reiterates that journalists focus too much on promoting "promising" new technology and proclaiming medical "breakthroughs" without asking for the facts to back up these stories, neglecting critical follow-up questions, and merely accepting spoon-fed information as fact.

Nowadays modern science rarely produces real breakthroughs, and rather moves forward slowly as one study builds on the last to gradually form new themes and theories (Goldacre, 2009:236). For this reason, Goldacre argues, science itself works badly as a news story. New studies either deliver so little new information that it has to be presented sensationally to make it newsworthy, or fascinating new results may turn out to be inaccurate as it hadn't yet been tested and confirmed by other scientists.

> "…if an experimental result is newsworthy, it can often be for the same reason that means it is probably wrong: it must be new, and unexpected, it must change what we previously thought, which is to say, it must be a single, lone piece of information which contradicts a large amount of pre-existing experimental evidence" (Goldacre, 2009:236).

2.3.2 Disease mongering

Just as sensational reporting can create false hope about new medical advances, it can also create unnecessary health scares and false hope when it is applied to new research on health risks. This was

the case with a 1998 study by Andrew Wakefield and others claiming that there was a link between autism and the measles, mumps and rubella (MMR) vaccine (Wakefield *et al*, 1998; Goldacre, 2009:290). The disproportionate attention given to this small study and other unpublished "evidence" in the media led to many parents in the UK not having their young children vaccinated, consequently leading to outbreaks of diseases and having a large impact on public health.

In the US, where celebrities such as the actress Jenny McCarthy (who bought into the MMR-autism conspiracy) have been advocating against the MMR vaccine, the cases of measles skyrocketed (Specter, 2013). In 2014 the US Centres for Disease Control and Prevention (CDC) reported over 600 cases of measles in 23 outbreaks across the country – more than triple the caseload from 2013 and the highest number of cases since the US declared that the disease was eradicated in 2000 (CDC, 2015). Several cases of the 2014 outbreak were linked to Disneyland – a popular amusement park in California (US). The disease was thought to have been inadvertently spread by infected staff members to visiting children from all over the country, who would spread it among unvaccinated children on their return home (Evans, 2015).

Following the measles outbreak, a law was passed in California in 2015 that requires all school pupils to be vaccinated against childhood diseases unless they have a medical reason to refuse (Bernstein, 2015).

The measles outbreak was not limited to the US and in 2013, the National Health Service (NHS) in Wales, UK, reported the biggest measles outbreak in the country in recent years, with 1 202 cases of which 88 resulted in hospitalisation and at least one death (Public Health Wales, 2013). An investigation launched by the NHS revealed that one in six children in Swansea, the area in Wales worst affected by the measles outbreak, did not receive the MMR vaccine. The poor uptake of the MMR vaccine was a result of parental concern over the safety of the vaccine (Public Health Wales, 2013).

Wakefield's study has since been retracted by *The Lancet* (Murch *et al.*, 2004), the journal that originally published it, and he has been found guilty of ethical misconduct and rigging the study findings in order to achieve his desired result. In 2010, Wakefield was struck off the medical register by the General Medical Council for serious professional misconduct, but he has since been running a campaign to counter this action, claiming that he was unfairly treated (Meikle & Boseley, 2010).

Schwartz, Woloshin and Moynihan (2008) report that medical journalism also falls prey to disease mongering by the pharmaceutical industry. They explain that within many disease categories, informal alliances have emerged, comprising drug company staff, doctors, and consumer groups. Supposedly engaged in raising public awareness about underdiagnosed and undertreated problems, these alliances promote a view of their particular condition as widespread, serious, and treatable. Because these

"disease awareness" campaigns are commonly linked to companies' marketing strategies, they operate to expand markets for new pharmaceutical products (Goldacre, 2012:247).

The pharmaceutical industry also uses disease mongering to medicalise ordinary processes or ailments of life in order to persuade the public to take medication (Moynihan *et al.*, 2002:887). Examples of this include: portraying mild symptoms as a sign of serious disease; portraying personal or social problems as medical ones; conceptualising risk as disease; and framing disease prevalence estimates to maximise the size of a medical problem (Moynihan *et al.* 2008:887; Goldacre, 2012:247-249, 266).

In the same way that the pharmaceutical industry can inflate the seriousness of symptoms or risk of disease, they have also been known to present research data in a way that makes their products look more effective than they actually are. A recent example of this was with Tamiflu – a treatment for flu produced by the pharmaceutical company Roche. The threat of a virulent strain of bird flu in 2008 led governments all over the world to stock up on Tamiflu. Evidence of the drug's efficacy for reducing complications from bird flu was largely based on a review article (the Kaiser paper) that summarised the results of 10 earlier trials, of which the results of only two papers were published. In 2009 researchers requested the original data for all the trials from Roche, but the company dragged its feet on the request for three years, and when the data was finally obtained it was clear that some of the studies were poorly designed bringing the results into question (Goldacre, 2012: 81-91 and Cohen, 2011:59-72).

2.3.3 Uncritical reporting

Public relations efforts by companies and research institutions often highlight the benefits, or potential benefits, of a product or treatment, while downplaying the potential side effects. Journalists with little knowledge of the topic or scientific processes, just regurgitate information fed to them by the company or institution in their own news reports (Nelkin, 1995:39).

Using the example of interferon – a type of protein that inhibits infection which was thought to have the potential to cure cancer in the 1970s – Nelkin (1995:3-5) illustrates how uncritical reporting (journalists only reporting on the potential benefits and not mentioning the side effects of the therapy) channelled research funding towards an ineffective treatment and raised false hope for many cancer patients.

> "Journalists, looking for a dramatic story and pressed for time, are inclined to believe their scientific sources and to rely on public relations professionals" (Nelkin, 1995: 133).

The "medical breakthrough" line is not only used by reporters to attract readers, but is also used by public relation efforts to attract media attention to a product or procedure to help increase sales or share values (Nelkin, 1995:138-139).

2.3.4 Inaccurate and/or misleading presentation of data

Goldacre (2009:225) is very critical of the way science is portrayed in the media and says that science stories in the mainstream press are generally presented in one of three categories: as wacky stories, "breakthrough" stories, or "scare" stories. Here's an example of the latter:

In 1993 an experiment in which scientists had duplicated human embryos in order to create additional embryos for *in vitro* fertilisation, was portrayed by the media as if this was a cloning technology for the mass production of human beings. "Envisioned were embryo and selective breeding factories, cloning on consumer demand, the breeding of children as organ donors, an industry of cloning and selling multiple human beings, and even a 'freezer section of the biomarket'" (Nelkin, 1995:45).

Studies assessing the extent and possible causes of inaccuracies in science reporting have produced mixed results. Nelkin (1995:118) reports that between 40 and 50 percent of scientists complain about inaccuracies, which usually occur as an omission of relevant information rather than actual inaccuracies, and that errors often derived from the reporter's attempt to translate complex technical terms into lay English.

The complexity of scientific subject matter reinforces the tendency of journalists to rely on news releases, press conferences, and other pre-packaged sources of information. The difficulty of interpreting complex technical material reduces the likelihood of sceptical, probing investigation. This poor understanding of science leaves journalists vulnerable to people presenting poorly conducted science and pseudoscience (Nelkin, 1995:119-120).

Aggravating this issue is scientists' distrust of journalists' abilities to interpret scientific data (Claassen, 2011:357-363; Mooney & Kirshenbaum, 2009:78) which make them weary of speaking to the media, broadening the divide between science and the layman. Claassen (2011:362) surveyed local scientist's attitude towards the media and found a substantial portion had little confidence in journalists' knowledge of science, and little interest in developing a better relationship with journalists.

2.3.5 Misinterpreting statistics

In order to make a statistic, particularly about risk, sound more dramatic, reporters use the relative risk increase rather than actual numbers to convey it (Goldacre, 2009:256). Using the example of how high levels of cholesterol increases the risk of heart attack, Goldacre (2009:256-257) illustrates how phrasing it in relative risk increase ("a 50 percent higher risk") sound more dramatic than using the absolute risk increase/natural frequencies (which in this case are two percent or "two extra heart attacks per 100 people"). Although not factually incorrect, a "50 percent increased risk" sounds more dramatic than "an extra two per 100", and it makes the risk seem more important than it actually is, and in that way misleads readers.

In addition to making the numbers look bigger, and more important, news outlets sometimes use it in the wrong context or just get it completely wrong. Goldacre (2009:260-262) uses the example of an *Independent* article that reported that high-potency cannabis was 25 times stronger than cannabis sold a decade ago. However, even the sources they quote report no more than three-fold increase in strength on average over that time period. Goldacre presumes that they probably compared the weakest cannabis from the past with the strongest cannabis of today to arrive at that dramatic figure, which is not representative of a general trend.

The **statistical significance** of research findings is another obstacle with which journalists often struggle. Statistical significance refers to the "likelihood that the result can be attributed to mere chance" (Goldacre, 2009:264). Statistical significance is presented by the p-value of a statistical calculation – a p-value 0.05 or less is considered statistically significant, while p-values higher than 0.05 are statistically insignificant, and might as well have happened by chance.

By way of a *Daily Telegraph* article reporting on the rise of cocaine use among school children, Goldacre (2009:263-264) explains the point. The *Telegraph* reported that cocaine use among school children doubled from 2004 to 2005, however, the government press release the article was based on said that there was no change in the pattern of drug use among the group. On further investigation, Goldacre realised that the newspaper based their findings on percentages that were **rounded off** (1% instead of 1.4% in 2004 compared to 2% instead of 1.8% in 2005). The "doubling" in frequency the newspaper reported was based on figures that were rounded off, while the actual difference was 0.4% giving it a p-value higher than 0.05. This indicates that the different result might as well have been by chance, making it statistically insignificant.

Another way in which journalists misinterpret numbers is by not putting the numbers into **perspective**. According to Blastland & Dilnot (2007:6-11) certain numbers may seem big, but when put into context are often not as impressive. They give the example of reports stating that the United Kingdom intends to spend £300 million to create a million new childcare places. It sounds like an impressive amount of

money, but when divided between a million places over five years, actually amounts to just £60 per place per year, which is certainly not as impressive as the £300 million figure.

> "Throwing away the mental shortcut – 'lots of zeros = big' – forces us to do a small calculation: divide the big number by all the people it is supposed to affect. Often that makes it strangely humble and manageable, cutting it to a size, after all, that would mean something to any individual…" (Blastland & Dilnot, 2007:11).

This lack of perspective often occurs in medical journalism while reporting on health scares. The **toxicity of a substance is in its dose**. This is as true for medication (that is beneficial in the right dose, but can be deadly in higher quantities) as it is for many other chemicals and substances (Blastland & Dilnot, 2007:11).

This is not a new concept and 400 years ago Paracelsus (1493-1541) noted that:

> "All substances are poisons; there is none that is not a poison. The right dose differentiates a poison from a remedy" (Paracelsus quoted in Timbrell, 2005:2).

News reports often alarm consumers when something that is harmful in a large quantity occurs in everyday items, even in miniscule quantities. Blastland & Dilnot (2007:14) give an example of sensational newspaper reports in 2005 that claimed that cooked potatoes contain the carcinogen acrylamide. Although not untrue, the reports failed to put the quantity at which acrylamide becomes harmful into perspective: "the quantity of acrylamide equivalent to that associated with a small increased risk of cancer in rats turned out to require consumption of about 30kg of cooked potatoes (about a third to a half of the typical human body weight) every day for years" (Blastland & Dilnot, 2007:15).

Statistics can also be misconstrued by the media when the health risk of exposure to an environmental factor over a lifetime (**absolute risk**), is confused with the risk per individual exposure (**relative risk**) (Blastland & Dilnot, 2007:83-84). This was the case with a 2002 BBC news bulletin which stated that: "For every alcoholic drink a woman consumes, her risk for breast cancer rises by 6 percent". The actual report from the researchers said that a woman's lifetime risk for breast cancer increases by 6 percent for every extra alcoholic drink she consumes daily, but the BBC attached the 6 percent risk to every drink, rather than the accumulated risk from a lifetime of alcoholic drinks (Blastland & Dilnot, 2007:83-84).

What was also missing from the report was the baseline number – i.e. the average woman's risk of developing breast cancer before considering her alcohol consumption habits. If her initial risk was, for

example, 10 percent, a 6 percent increase on that would only amount to a 0.6 percent increase in risk over her lifetime – a far cry from the 6 percent increase for every drink and a lot less alarming (Blastland & Dilnot, 2007:84-86).

Baseline data is important because it provides perspective. Blastland & Dilnot (2007:88-89) illustrates the point with an example of a 2005 report by the British Radiological Protection Board stating that cellphone use doubles a person's risk for developing a brain tumour. It turned out that the baseline risk for these particular tumours were one in every 100 000 people, and a doubling in risk equates to two in every 100,000 people, or a 0.002 percent chance of developing the disease. Although it is not technically incorrect to report a doubling in risk, it is a deliberate attempt to make the risk appear more serious than it actually is.

When calculating statistics, most researchers will report a range within which they estimate the accurate number or statistic to be. This is called the **confidence interval** and is used to make allowance for any possible inaccuracies (Blastland & Dilnot, 2007: 94-95). However, most often the media do not report the confidence interval but rather focus on the mean number as if it were correct.

Correlation and causation can also be misconstrued by the media (Blastland & Dilnot, 2007: 164-165). Just because two phenomena occur together, it doesn't mean that the one phenomena is caused by the other. An example used by Blastland & Dilnot (2007: 164-166) to illustrate the point is the correlation between multiple sclerosis and lesions in the brain. MRI scans have revealed that people with multiple sclerosis also have lesions on their brain, leading many to believe that the lesions are responsible for multiple sclerosis. After extensive research, doctors found a drug that healed the lesions, however, the multiple sclerosis did not subside. In health journalism, assumptions that correlation is a sign of causation can cause false hope for a cure, as illustrated by the case of the so-called link between multiple sclerosis and brain lesions, or can cause unnecessary alarm when a risk is attached to a phenomena that coincides with a disease or health scare.

2.3.6 Pseudoscience

> "The role the media can play to counter pseudoscientific beliefs, cannot and should not be underestimated" (Claassen, 2016).

Journalists' own lack of scientific knowledge often result in them inadvertently or knowingly promoting pseudoscience (Goldacre, 2009:1-2, 6). Goldacre illustrates this occurrence by providing examples of

testimonials and articles on quack therapies like detox foot spas, patches and ear candles that have appeared in authoritative British news outlets such as the *BBC*, *Sunday Times* and the *Observer*.

Claassen (2016) also provides some South African examples of pseudoscience uncritically being promoted in the local media:

> "… Ruda Landman and George Mazarakis on M-Net's Carte Blanche with liberal exposure given to psychics like Marietta Theunissen and the ex-detective Danie Krügel with his 'magic' machine to find the missing children abducted by Gert van Rooyen in the 1980s; KykNet's Via lifestyle channel giving another psychic, Julia Theunissen, a weekly platform to 'talk to the dead'; and the radio presenter of the SABC's Afrikaans radio station, RSG, Amore Bekker, who every week uncritically interviews an ex-actress, Antoinette Pienaar, on why herbs can cure virtually every illness."

Goldacre (2009) argues that these products are often packaged and presented to appear scientific: "…many of them offer excellent and lengthy documents full of science to prove that they work: they have diagrams and graphs, and the appearance of 'scienciness'; but the key elements are missing" (Goldacre, 2009:9). A 2008 article in the *Journal of Cognitive Neuroscience* explains the reason for the fake scientific presentation, which is that people are more likely to buy into "bogus explanations" when they are presented with technical scientific words (Goldacre, 2009:16).

Although research by pseudoscience practitioners may follow the correct procedures and methods (although often they do not), something can still be labelled as pseudoscientific if the "claimed knowledge is sufficiently implausible" (Bauer, 1994:136).

> "A claim is not valid just because some people can tell us that they have tested and found good some hypothesis that they themselves constructed. Every quack can tell stories of success, and some quacks even believe their own stories and even have some grounds for doing so" (Bauer, 1994:58).

Pseudoscience does not only present in treatments and therapies, but also in other practices. A recent, and very tragic example was that of AIDS denialism (the belief that HIV does not cause AIDS) that prevented the former South African president Thabo Mbeki and the late Minister of Health, Manto Tshabalala-Msimang, from providing antiretroviral treatment to people with HIV, resulting in thousands of preventable deaths in the country (Pigliucci, 2010:59-60; Chigwedere *et al.*, 2008:410-415).

Another popular example is astrology, as can be seen in the many newspapers and magazines that still carry "your stars" pages in every issue. Although astrology's claims have repeatedly been shown to be

wrong, many people still take its predictions very seriously and waste a lot of money on its practice (Pigliucci, 2010:62; Dawkins, 1995).

One needs a clear understanding of what science is, in order to understand what it is not: pseudoscience. As discussed in detail above, science, or rather the scientific method, follows a controlled systematic process to reach a conclusion that has to be scrutinised and retested by scientific peers before it is accepted or rejected. Specific methods and techniques have therefore been developed to ensure uniformity in scientific practice while formal testing processes are also in place to try and minimise errors.

The essence of science lies in the continuous gathering of knowledge through testable methods – "attributes that are obviously missing in quackery practices" (Claassen, 2014:28).

> "…at the heart of science is an essential balance between two seemingly contradictory attitudes – an openness to new ideas, no matter how bizarre or counterintuitive, and the most ruthless sceptical scrutiny of all ideas, old and new. This is how deep truths are winnowed from deep nonsense. The collective enterprise of creative thinking and sceptical thinking, working together, keeps the field on track" (Sagan, 1996:287).

Casti (1990) developed the following set of criteria to identify pseudoscience:

- "Scientific" theories that make use of anachronistic thinking, i.e. it relies on "ancient wisdom" that is based on superstition as proof rather than tested science.
- It seeks mystery and the "science" is often based on "theories" that are not fully understood.
- Pseudoscience often appeals to the idea that ancient myths must be based on some kind of real events.
- It follows a casual approach to evidence.
- The hypothesis is irrefutable and any challenge to the theory, regardless of evidence, is rejected.
- Unrelated phenomena are linked without considering coincidence.
- Explanation by scenarios and anecdotes not substantiated by facts.
- Research is based on literary interpretation that suggests there are more than differing explanations/ interpretations for phenomena.
- Refusal to revise a position/theory even in the face of new evidence.
- Shifts the burden of proof to the other side and claims to be right simply because s/he has not been proven wrong.
- A theory is legitimate simply because it is new, alternative, or daring – the so-called "Galileo" effect.

Claassen (2014:2-15 & 30-31) provides some additional points to help identify pseudoscience:

- It sounds too good to be true.
- Anecdotes are presented as evidence.
- Evidence is directly presented to the mainstream media without undergoing peer review.
- Conspiracy theory: i.e. the developer or innovator claims that a powerful institution is trying to cover up his/her findings.
- The scientific effect of a claim borders on the extreme.
- The claim that something is true because it is thousands of years old.
- The developer/innovator is a maverick.
- A new natural law has to be introduced to explain the theory.
- Distancing him- or herself from responsibility through a disclaimer.
- Pseudoscientists present themselves as gurus, shamans, prophets or other authority figures, whereas in science there is no need to prove ultimate authority, at most there are experts.
- Pseudoscience rejects complex explanations/hypothesis and maintains one "holy grail of truth".
- The language of true science is mathematics/numbers/statistics.
- Each link/step in a theory should be plausible.
- Pseudoscience is often wrapped in "fluff" of nonsense that doesn't make any sense.
- Check to see if the hypothesis can be falsified.

Promoters of pseudoscience can be seen to use various tactics to sell their unproven services or wares to a gullible public. According to Barrett & Herbert (2014) these so-called "quacks" target people on an emotional level.

> "Their basic strategies are to promise the moon and knock the 'competition'. To one and all, they promise better health and longer life. They offer solutions for virtually every health problem, including some they have invented. To those in pain, they promise relief. To the incurable, they offer hope. To the nutrition-conscious, they say, 'Make sure you have enough.' To a public worried about pollution, they say, 'Buy natural.' For ailments amenable to scientific health care, they offer 'safer nontoxic alternatives.' And they have an arsenal of ploys for defending themselves against criticism. To gain your allegiance it is not necessary to persuade you that all of the statements below are true. Just one may be enough to hook you" (Barrett & Herbert, 2014).

In addition, Offit (2013:525) explains that while mainstream medicine is considered "spiritless and technological", alternative therapies are often "spiritual and meaningful":

> "Although modern science offers the prospect of longer lives, it doesn't offer the prospect of more meaningful lives. Alternative medicine, on the other hand, offers something greater: better health imbued with a deeper sense of purpose" (Offit, 2013: Kindle location 525).

Practitioners of pseudoscience offer an alternative to allopathic/mainstream medicine that is "natural", free of side effects and follows a holistic approach to eliminate the cause of the disease, and not just to treat the symptoms (Barrett & Herbert, 2014; Offit, 2013: Kindle location 43-100; 503; Ernst, 2016). These claims are mostly unsupported by any proper scientific evidence, use genuine scientific findings out of context, or are based on anecdotal evidence or "ancient wisdom" (Claassen, 2014:49-51; Barrett & Herbert, 2014; Offit, 2013: Kindle location 511).

But alternative therapies are not as harmless as they seem and according to MacDonald (2016):

> "A whole lot of people use herbal remedies with the assumption that even if they don't work, they're not really doing any harm… but that is not always the case" (MacDonald, 2016).

Apart from wasting money on ineffective treatments or forgoing proven medical treatments for unproven alternative treatments, some of these therapies can actually harm a person's health (Offit, 2013: Kindle location 705; Ernst, 2016). For example, nutritionists have been promoting the use of vitamin supplements for improved general health and even the treatment of various diseases ranging from the common cold to cancer. However, in recent years more research have revealed several risks (including serious perils such as an "increase in overall mortality") associated with excessive vitamin intake (Offit, 2013: Kindle location 689-712). Other products touted by the nutritional supplement industry also have known health risks: fava beans can cause anaemia; berries from the coyotillo plant can cause paralysis; milkweed seed oil and bitter orange can cause heart damage, etc. (Offit, 2013:Kindle location 1031-1051).

Pseudoscience practitioners also rely on conspiracy theories, for example, the theory that mainstream doctors and the pharmaceutical industry suppress scientific evidence in order to continue making money by treating people that can be cured by alternative treatments (Claassen, 2014: 49-51; Offit, 2013: Kindle location 2377). This is of course untrue and is a useful ploy to explain or gloss over the lack of evidence for their practice.

As was the case with the mistaken belief that the MMR vaccine caused autism, a falsehood widely promoted by actress Jenny McCarthy, celebrity endorsement often promotes the uptake and sale of alternative therapies (Offit, 2013: Kindle locations 199-220; 302-308; 1236-1256). More examples of this include the 1970s actor Steve McQueen's endorsement of laetrile (a substance derived from apricot pips) and coffee enemas for the treatment of cancer, which failed to cure him (he died in 1980), and the popular American talk-show host Oprah Winfrey's endorsement of Mehmet Oz, star of *The Dr Oz Show*, a cardiovascular surgeon who often pronounces his mistrust of modern medicine on his television show, where he also touts unproven alternative therapies like homeopathy, faith healing and communication with the dead (Offit, 2013: Kindle location 308-322).

Claassen (2016) also provides several South African examples where celebrities have endorsed pseudoscience:

> [Celebrities] "link their names to quackery products and vitamin gimmicks, and either market these actively, or through institutional quack institutes (marathon champion Bruce Fordyce promoting a balance bracelet, as do some members of the Protea cricket team…" (Claasens, 2016).

In addition to the abovementioned challenges to good science reporting, journalists also have to navigate other obstacles.

2.4 Other obstacles for journalists

The news production processes at most media outlets are not conducive to good science/medical reporting. Short deadlines and the competition to beat rivals to a story encourage a focus on "breaking news" rather than on issues that are more technical or require extensive research (Nelkin, 1995:105).

> "…the focus on 'breaking news' limits analysis of the method and processes of science; however important in assessing the significance of research, methods are not considered news" (Nelkin, 1995:105).

In 1995, Nelkin (1995:117) reported that there were about 50 000 scientific journals and about one million papers being published every year. Although medical papers only make up a portion of that, this large number of articles illustrates the vast amount of complex scientific information that is being produced, making it impossible for even a trained medical reporter to stay ahead of the trend. And a journalist unfamiliar with the science/medical beat would find it evermore difficult to make an informed judgement on the relevance or importance of scientific material.

Public relations efforts prey on journalists' being short on time but still needing to fill newspaper/magazine pages or time slots (Goldacre, 2009:228). They provide journalists with prepared "news items" that are uncritically being rehashed by reporters – a practice investigative journalist Nick Davies calls "Churnalism" (Davies, 2008:59-70).

Journalists are often also constrained by the limited space allocated to their stories (Low, 2003:52). Most newspaper stories may be no longer than a few hundred words, giving journalists only a few paragraphs in which to summarise complicated scientific facts and concepts. The space is usually just enough to highlight the most important facts, while background information and additional context are often left out.

> "For example, an editor might allocate 400 words for a story on some new research. The research might be quite complex and hard to explain. The writer might struggle to convey the necessary doubt and place the piece in perspective within the limited space. He might also struggle to find experts to appraise the research critically. Having done his best, he may still see the story in the next day's paper cut to 300 words, with a misleading headline slammed on top of it. But by now, the journalist is already facing a new day's stories. Pressures such as these make it hard to write accurately and responsibly" (Low 2003:53).

2.5 Earlier research on health reporting in South Africa

In 2001, Galloway studied the state of South African journalism on the HIV/AIDS epidemic. Through case studies and interviews she assessed how newspaper journalists at the time were reporting on HIV/AIDS and what their role should be in assisting to combat the epidemic by, for example, improving the knowledge of the disease and encouraging preventative action. Galloway's major findings included an absence of "genuine" science reporting on the HIV/AIDS epidemic, a need for non-sensationalist reporting on the disease and ongoing, targeted coverage that would help to educate readers. She also identified a need for patient voices to be represented in news reporting.

Fourie (2003) analysed the media's coverage of the HIV/AIDS epidemic, focussing specifically on two daily newspapers in South Africa. She argued that the media have been unsuccessful in their responsibility to communicate information, statistics and new research on HIV/AIDS to the public, and ascribed these shortcomings to a lack of understanding of the issue by the media. Fourie (2003) maintained that the magnitude of the HIV/AIDS issue necessitated more proactive action by the media in order to effectively play their role in addressing the issue.

Malan (2003) examined the development of the politics surrounding the science of AIDS as well as the news media coverage of the process. Her study followed the AIDS-dissident debate which started in the USA in the 1980s to the time it reached South Africa in the 1990s, where it was further fuelled by South Africa's former President, Thabo Mbeki. Malan's research then looked at the coverage of these scientific and political issues by the South African media, which had little or no knowledge of HIV/AIDS at the time.

Mattheyse (2006) analysed the health reporting in three South African monthly women's magazines, namely *Sarie, Fair Lady* and *True Love*. She studied the health-related articles published in these women's magazines over the period of one year (February 2005 to January 2006) to analyse the various health topics they covered and to determine whether there was a balance in the emphasis given to the different health topics. Mattheyse (2006) found that all three magazines dedicated the most space to

articles focusing on mental, general and sexual health, resulting in an unbalanced view on South African health issues that were in fact overshadowed by the HIV/AIDS epidemic.

Bolognesi (2006) analysed the media portrayal of the antiretroviral drug Nevirapine in Western Cape daily newspapers. By means of a content analysis of news reports she found a relatively high negative media portrayal of Nevirapine, which could potentially discourage HIV-positive women from taking a safe and effective drug to prevent HIV transmission to their children. Interviews with media practitioners ascribed the negative portrayal of this drug to a Western-style media policy, which Bolognesi argued was ill-suited to a developing nation such as South Africa where media sensationalism is often read as fact by a large proportion of the educationally-challenged population. She suggested a shift in local media policy with regard to health reporting that would incorporate elements of development journalism which would communicate locally-relevant scientific information on AIDS treatments.

2.6 Summary

This chapter looked at the complex nature of the scientific process and the challenges journalists face while reporting on scientific research. The common errors journalists make as well as other pressures that impact on the reporting process was discussed. Lastly, there was a brief look at some of the previous research conducted on medical journalism in South Africa as well as the main findings or recommendations that were drawn from the research.

The next chapter will focus on the theoretical framework used for this study, which is based on the field of ethics, and in particular the social responsibility theory. The potential impact medical reporting can have on people's health and wellbeing places a large burden of responsibility on journalists who cover health-related issues to report accurately and truthfully on these topics.

CHAPTER 3 – THEORETICAL FRAMEWORK

Chapter 2 provided an overview of some basic scientific principles and practices, and highlighted the errors that journalists often make while reporting on new scientific research. The theoretical framework for this study, which is embedded in ethics and in particular the social responsibility theory, will be discussed at length in this chapter.

News items reporting on new medical research have the potential to affect audience members' behaviour by, for example, influencing what food they eat, or what medication they take, which by implication can have an impact on their health (Nelkin, 1995: 68; Dentzer, 2009:1; Entwistle, 1995:920).

> "…people welcome science news that relates to health and disease and to waste disposal, suggesting that science news is mainly valued in terms of its relationship to the problems of daily life. Many people, for example, use the media as their primary means of learning about ways to keep healthy and fit" (Nelkin, 1995:68).

The impact of these news reports is not limited to the choices individuals make about their own health. Research has also shown that medical professionals often learn of new medical findings via reports in the mainstream media, which could have an impact on the way they treat patients (Nelkin, 1995:8, 73). Furthermore, policymakers also use the media as a source of information when formulating policy which could impact on public health (Nelkin, 1995:8, 73).

The potential impact that news reports could have on individual and public health, highlights the enormous responsibility of the media to ensure information is portrayed accurately and responsibly. This relates to ethical practice in media work, and in particular to the theoretical framework of social responsibility, which will be discussed at length in this chapter.

3.1 Background on ethics

Ethics is a centuries-old philosophy that deals with right and wrong. The word "ethics" is derived from the Greek word *ethos*, which means "character" or "what a good person does" (Krüger, 2004:1).

> "As a field of philosophical inquiry, it deals with morality, moral judgments and the meaning of concepts like right and wrong. At a more practical level, it considers what should be done in particular situations" (Krüger, 2004:1).

Ethics is distinct from the law and sets the highest standard of ideal behaviour – the law is concerned with the minimum standards that people should adhere to. Unlike the law, that punishes those who do not adhere to it, ethics appeals to a person's responsibility and conscience and most often does not carry punitive measures (Krüger, 2004:1-2).

Meta is the Latin word for "behind" or "underneath" and metaethics is a theoretical field of study centered on the nature of ethics (Retief, 2002:7). It searches for the meaning of terms like justice and fairness, attempts to identify moral values and forms theoretical foundations of codes of ethics or conduct.

In the field of journalism, metaethics studies the paradigms underlying the choices that journalists make (Retief, 2002:7). There are two main paradigms, namely the consequentialist approach (teleology) and the non-consequentialist approach (duty-based/deontology). The first judges the ethical implications of a journalist's actions by the expected consequences, while the second applies principles of duty without necessarily taking the consequences of actions into consideration.

Normative ethics builds on metaethics and develops general theories and principles for moral behaviour and ethical decision-making (Retief, 2002:11). It reveals itself in theories of the media in general and in journalistic codes of ethics.

Underlying any specific theory of the media are basic beliefs and assumptions (paradigms), which have philosophical and cultural bases and which give rise to a specific social system or a combination of political systems – which has everything to do with how the role of the media is seen (Retief, 2002:11).

> "…the press always takes on the form and coloration of the social and political structures within which it operates. Especially, it reflects the system of social control whereby the relations of individuals and institutions are adjusted" (Siebert, et al., 1984:1)

There are various theories about the media's role in society. It differs between countries and is related to the political rule and circumstances of each specific society. These roles range from being a mouthpiece of government (authoritarian) or a tool that serves in the development of a country (developmental), to being a watchdog of government and other authorities (libertarian) (Retief, 2002:11-17).

3.2 Theories of the Press

Siebert *et al*. (1984:2-6) developed the "Four Theories of the Press" to explain the various roles and practices that the media follow in different societies.

The first theory, authoritarianism, is the oldest of the four media theories and was developed in the 16th and 17th century England (Siebert *et al*.,1984:7). This theory started with the invention of the printing press and postulates that the truth was a product of only a few wise men, that the truth resided near the seat of power, and that it functioned from the top down (Siebert *et al*. 1984:7; Retief, 2002:11-12). Retief (2002:12) states:

> "The rulers used the press to inform the public of what they 'should' know (read: the policies of the rulers that should be supported). The press belonged to the rulers and was in their service" (Retief, 2002:12).

In the authoritarian system, the media are servants of the state who therefore can not be critical of government.

The second theory, libertarianism, was developed in the 17th century and was a direct reaction to the authoritarian model. This system developed alongside a shift in philosophical perceptions about the relationship between individuals and the state. It assumes that individuals were rational beings who could distinguish between truth and falsehood, and who were not dependent beings that had to be led by the state (Siebert *et al*.,1984:40-41; Retief, 2002:12).

> "Truth was no longer seen as the property of the powerful. Instead, the right to search for truth became an inalienable human right. In this search, the press became a vital partner" (Retief, 2002:12).

According to the model above, the press played the role of "watchdog of the state" where criticism of government was no longer punishable by government. Censorship was abolished and a "marketplace of ideas" was developed (Retief, 2002:12).

This study relates to the third theory of the press, the egalitarian, or social responsibility theory, which developed in the 20th century and is a variant of the libertarian model. The egalitarian model is the one mainly being followed by the South African media (Retief, 2002:18-21; Oosthuizen, 2014:37; Siebert *et al*., 1984:74).

This paradigm is concerned with journalists' responsibility to deliver balanced, accurate and non-sensationalist reports about the issues/topics that they cover (Retief, 2002:13-16).

The social responsibility theory developed in response to the so-called "communications revolution" that occurred in the 20th century when advances in communication made it possible to deliver news via television, and later via satellite. These developments substantially increased the influence that the media have on society, and consequently placed a large responsibility on the media to prevent causing any unnecessary harm (Retief, 2002:13-14).

In response to widespread criticism of the American newspaper press, the Hutchins Commission (a group of academics under the leadership of the chancellor of the University of Chicago, Robert Maynard Hutchins) was appointed in 1942 to study the state of the media and to determine whether the freedom of the press was in danger. This was in response to concerns that the media were too concerned with sensation, lacked depth, and were not concerned with journalistic excellence (McQuail, 2005:170; Retief, 2002:14).

In 1947, the Hutchins Commission issued a report that concluded that the freedom of the press was in danger because: the press had increased in importance and visibility; the press had not provided a service adequate to the needs of society; and that minorities had engaged in practices that could lead to government regulation or control (Retief, 2002:15).

The report also found that the media gave too much attention to the trivial and sensational, and that reports were often meaningless, flat and distorted, and perpetuated misunderstanding. Media coverage represented the exceptional rather than the representative and the sensational rather than the significant. The commission also criticised the concentration of press ownership and the media's exaggerated drive for power and profit (McQuail, 2005:171; Retief, 2002:15).

> "In short, the press was not meeting its responsibility to provide a truthful, comprehensive, and intelligent account of the day's events in a meaningful context" (Retief, 2002:15).

The Hutchins Commission laid the foundation for the concept of social responsibility within the media. It recommended that the press become accountable and suggested that a self-regulating body be formed to ensure professional conduct would be adhered to (Retief, 2002:15-16).

According to Oosthuizen (2014:36-37), in terms of the social responsibility theory the media should:

- Accept certain responsibilities towards society, including setting professional standards for the supply of information that is truthful, accurate, objective and provide balanced views in their reporting;
- Apply self-regulation;
- Avoid publishing information that could lead to violence or social disruption, or that could offend minority groups;

- Reflect a diversity of content to ensure public access to a variety of viewpoints; and
- Expect societal intervention if the media fail to meet professional standards.

The social responsibility model relies on the media's ability to regulate itself.

The fourth theory of the press, the Soviet Communist model, developed in the late 19th century and is an offshoot of the authoritarian theory. According to this system the main purpose of the media is to contribute to the success and continuance of the Soviet socialist system, and especially the dictatorship of the party. According to Oosthuizen (2014:37):

> "Under this dispensation, the media are owned and controlled by the state, which represents the working class or proletariat. The working class own the natural resources of production and distribution, and controls the means of mental production, including the media, as directed through their membership of the Communist Party" (Oosthuizen, 2014:37).

However, with the disintegration of the Soviet Union, this theory ceased to apply and no post-Communist theory of the press has emerged (Christians *et al*. 2009:12).

Two more theories of the press, namely the developmental theory and the democratic-participant theory, have been developed since Siebert *et al*. formulated the original Four Theories of the Press in 1956 (Oosthuizen, 2014:39-44).

The developmental theory grew out of the unique circumstances within developing countries, which included the absence of communication infrastructure and professional skills, poverty and illiteracy. This theory partly wants the media to make a contribution towards improving the position of developing countries, while at the same time, warding off what they perceive as the potential negative effects of Western-dominated media reporting on the developing world (Oosthuizen, 2014:39).

The democratic-participatory theory takes issue with the way in which libertarian media portray news from the developing world. Supporters of this theory argue that democracy has failed to deliver real representation for citizens at grass roots level and that the focus has to move from representative government to participative government, in which civil society play a more prominent role (Oosthuizen, 2014:42).

> "The driving force behind this reassessment was to secure better access and participation by the public in the governmental process. The democratic-participative media theory reassesses the role of the media within this framework. The emphasis is primarily on securing access to the media for the citizenry" (Oosthuizen, 2014:42).

This concludes the theories of the press and in the following section media ethics and regulation will be discussed.

3.3 Media regulation

Like many other professional people, such as doctors or attorneys, journalists have to make complicated decisions in their daily work, and they use ethical codes to guide them with this decision-making. These codes follow certain conventions, mainly revolving around truthful, objective and balanced reporting (Oosthuizen, 2001:181).

But unlike these other professionals, journalists do not have their right to practice revoked when they fail to observe these codes and the responsibility to regulate ethical conduct in this profession is placed on the media itself (Krüger, 2004:35).

Guidelines prescribing the correct conduct that journalists ought to follow are captured in media outlets' codes of ethics/conduct. Most codes concentrate on the provision of reliable information and avoiding distortion, suppression, bias, sensationalism and the invasion of privacy (McQuail, 2005:174).

Journalism in South Africa, like many other countries in the world, is self-regulating and falls under bodies set up by the industry (Krüger, 2004:36). Self-regulation implies that misconduct be brought under the attention of these bodies – in South Africa there is the Press Ombudsman (presiding over the printed press) and the Broadcasting Complaints Commission (responsible for radio and television broadcasting) – who will investigate claims.

Journalists or media outlets found guilty of misconduct usually have to correct their mistakes by way of a public apology – no fines or further punishment can be meted out by the Press Ombudsman, but the Broadcasting Complaints Commission can issue a fine of up to R80 000 (Martin, 2016). Any claims where financial compensation is sought from misconduct by the media, is referred to a court of law. The justification for self-regulation of journalism has been described as such:

> "The case of self-regulation rests on the premise that in complex democratic societies self-imposed rules are likely to carry a greater moral authority, and consequently, to work with greater effectiveness than externally imposed rules" – former chairperson of the British Press Complaints Commission, Lord Wakeham (Krüger, 2004:35).

A shortcoming of self-regulation is the potential that journalists might "look after their own" in a way that undermines the system. "If they have any value at all, press councils must on occasion be prepared to take a sharply critical look at what is being done in the media" (Krüger, 2004:36).

One area where the media in South Africa are regulated by the state is through the controversial Protection of State Information Bill, which was passed in 2011, but has since been sent back to parliament for reconsideration. The Bill aims to 'protect' state information from disclosure to safeguard the national security of the country. According to the Bill, the publication of information classified by the state would be unlawful, and penalties could be imposed on offenders (Oosthuizen, 2014:129).

3.4 Media ethics

According to Retief (2002:4), everything journalists do has ethical dimensions to a lesser or greater degree:

> "Because everything a journalist writes or says, or neglects to write or to say, in some or other way has an *influence* on people. And influences can be good or bad" (Retief, 2002:4).

Due to the media's enormous potential influence, it is vital that journalism be practiced in an accountable and responsible way. According to Black & Roberts (2011:1):

> "People who work in traditional and emerging forms of journalism … play significant roles in contemporary life. A society that expects its citizens to be informed and its consumers to be discriminating must be served by moral media" (Black & Roberts, 2011:1).

Retief (2002:4) warns that the media can harm its own, or others' reputation when it acts irresponsibly. He identifies the following potential consequences of irresponsible journalism:

- Unnecessary harm is done to people;
- The media lose credibility;
- This weakens the media's vital role as watchdog;
- The wellbeing of democracy suffers.

3.5 Ethical principles for journalism

There are four main ethical principles generally ascribed to journalism: truth telling; independence; minimising harm; and accountability (Krüger, 2004:12-13). These principles are often in conflict with each other and practicing media ethics often relates to efforts to try to find a balance between these principles.

These principles are also captured in the Press Council's Code of Ethics and Conduct for South African print and online media (Press Council, 2016), which are:

> "1.1. The media shall take care to report news truthfully, accurately and fairly…
>
> 2.1. The media shall not allow commercial, political, personal or other non-professional considerations to influence or slant reporting. Conflicts of interest must be avoided, as well as arrangements or practices that could lead audiences to doubt the media's independence and professionalism…
>
> 3.2. In the protection of privacy, dignity and reputation, special weight must be afforded to South African cultural customs concerning the privacy and dignity of people who are bereaved and their respect for those who have passed away, as well as concerning children, the aged and the physically and mentally disabled.
>
> 3.3. The media shall exercise care and consideration in matters involving dignity and reputation…" (Press Council, 2016).

The first principle of truth telling refers to how journalistic reports should aim to convey information as truthfully as possible. Two important subthemes are accuracy and fairness (Krüger, 2004:12-13). As stated by Retief (2002:67):

> "The reasons why truth is so vital to journalism are evident: without the truth a journalist has neither integrity (what you think of yourself) nor credibility (what others think of you); the public needs accurate information to be able to make informed decisions; it demonstrates a respect for people as people (they are not objects to be manipulated); and it builds a relationship of trust between the media and the public" (Retief, 2002:67).

Adding to the above, Day (1991:72-75) identifies three concepts that underlie the notion of truth in reporting. These are:

> 1. Accuracy – facts should be based on solid evidence and any doubt should be revealed to the audience.

2. Promote understanding – a news report should contain as much information as needed to afford the average reader an understanding of the facts and its context.

3. Fairness and balance – avoid any bias by the reporter and present facts and views fairly and in context.

Retief (2002:86) furthermore defines fairness as follows:

> "Fairness is an attempt to: balance your report in such a way that no party is misrepresented either by your choice of words or by the lack of the proper context (that would be unjust); ensure that all parties get their say (equality); give coverage to different parties in relation to their importance (moderation)".

The second principle of independence, relates to influences (for example personal, commercial or political) that may impact on a journalist's credibility (Krüger, 2004:13). Conflicts of interest arise when a journalist has interests outside of his or her professional realm that clash with their work or inhibit them from independent reporting (Retief, 2002:133).

According to Krüger (2004:13), the media's credibility can be severely affected by any perceived or real conflicts of interest.

> "We are unable to work if audiences discount our reporting because they see it as influenced by considerations outside of journalism, such as any personal, commercial or political motives" (Krüger, 2004:13).

A common result of journalism is that people get hurt – whether through reliving a trauma; tarnishing of a person's reputation; ridicule or offence. Often this harm is unavoidable, but in line with the third principle – reducing harm – it is the responsibility of the journalist to be cognisant of it, and to avoid causing unnecessary harm (Krüger, 2004:13). According to Retief (2002, 171):

> "All too often it is the bleeding victims, crying relatives, dead bodies, and insensitive questions that dominate news reports. Events are often dramatized and presented so as to attract attention – in order to sell. The focus is on people's emotions, and often the traumatic events are recorded in unnecessary detail" (Retief, 2002:171).

Krüger (2004:13) explains that although causing harm is not always entirely avoidable, "sometimes it is even necessary", journalists should be aware of the potential harm and try to minimize it.

Accountability, according to Retief (2002:5), is "the quality or state of giving an account, of answering, explaining or of being liable and responsible". Journalists should be prepared to answer for their work

to their audience by means of handling reader queries, and where necessary, apologising if they got something wrong (Krüger, 2004:13).

All the above mentioned ethical principles are as important in the news reporting of new medical research (which is the focus of this research) as in any other genre of journalism. The common mistakes made by journalists, outlined in Chapter 2, mostly relate to inaccurate reporting (truth telling) and journalistic independence that is threatened by public relations efforts, both which have the potential to cause harm (through poor medical advice, creating false hope or scaremongering). It is for this reason that the reporting of new medical research is being considered within the framework of media ethics.

In this chapter the theoretical framework for the study, namely ethics, and the social responsibility theory of the press were discussed. Chapter 4 will provide a detailed outline of the research methodology followed in the conduct of this study.

CHAPTER 4 – RESEARCH METHODOLOGY

The theoretical framework followed in this study, namely ethics and in particular social responsibility theory, was discussed in Chapter 3. In this chapter the research methodology used will be elaborated on.

The aim of this research was to rate the standard of news articles reporting on new medical research that were published in six South African daily newspapers over the 12-month period from 1 January 2014 to 1 December 2014.

The relevance of this study is based on the potential impact that health news articles have on the public's wellbeing, which makes it particularly important for journalists to report accurately and truthfully in their work.

4.1 Research methodology

This study was conducted following a quantitative approach, using the content analysis research methodology.

> "The quantitative approach involves some form of counting, and applies the scientific method rigorously" (Du Plooy, 1997:32).

The research attempted to quantify the standard of health-reporting by scoring each article through the method of content analysis against a list of 10 specific criteria (see section 4.4), and finally awarding the article a percentage mark out of 100.

Content analysis is a research method for the objective, systematic and quantitative description of the content of communication. It measures the amount of something (in this case the criteria required for a good news article on health research) in a selected sample of mass media communication (Du Plooy, 1997:152).

The method of content analysis evaluates the content of documents or news items, in this instance newspaper articles (Mouton, 2005:165).

> "Content analysis is a research method based on measuring the amount of something (e.g. violence, negative portrayal of women, or whatever) found in a representative sample of a mass-mediated popular art form" (Berger, 1991:25).

Babbie (1989:294) considers content analysis "particularly well suited to the study of communication" as it provides insight into the communicator's intention and the recipient's interpretation of the message (Du Plooy, 1997:153).

4.2 Newspaper selection

The six newspapers studied included three national and three provincial newspapers. All six newspapers were published daily (at least five times a week). The provincial newspapers were selected in order to gain insight into the quality of health/science journalism in the Western Cape, while the national newspapers provided a snapshot of the national situation.

The six newspapers selected were:

1. ***Business Day***

   A national newspaper published five days a week (Monday to Friday) which has a daily circulation figure of 24,672 (Audit Bureau of Circulation, 2016). Although the newspaper covers all news genres, it has a specific focus on economic, financial, and business news. The paper has an accompanying website, www.BDlive.co.za, where newspaper articles and other news items are published daily (*Business Day*, 2016).

   Business Day is the only South-African newspaper with a dedicated science desk and science editor (Claassen, 2011). The newspaper is owned by The Times Media Group and was established in 1985.

2. ***Cape Times***

   An English-language regional newspaper distributed in the Eastern- and Western Cape provinces of South Africa. It is a morning newspaper that is published from Monday to Friday and has a daily circulation figure of 31,767 (Audit Bureau of Circulation, 2016). It covers all genres of news. In addition to the printed paper, it also has a website, www.iol.co.za/capetimes, where newspaper articles and other news items are published (*Cape Times*, 2016). *Cape Times* was established in 1876 and is part of the Independent Media Group.

3. ***Die Burger***

A regional daily newspaper with two separate editions that are published six days a week (Monday to Saturday) for the Eastern- and Western Cape. It is the only Afrikaans-language publication selected for this study. It has a daily circulation figure of 51,810 (Audit Bureau of Circulation, 2016). The title is also available online at www.netwerk24.com (Media24, 2016). *Die Burger* was established in 1915 and is owned by Media24.

The newspaper ran a weekly science news editorial from 2001 to 2013.

4. ***Cape Argus***

This regional English-language newspaper is distributed in the Western Cape Province. Five editions are published every week from Monday to Friday and the newspaper is estimated to have a daily readership of 30,524 (Audit Bureau of Circulation, 2016). An online version of the title is also available at www.iol.co.za/capeargus (*Cape Argus*, 2016).

Cape Argus is the oldest daily newspaper in South Africa and was established in 1856. It has undergone several changes in ownership and is currently part of the Independent Media Group.

5. ***The New Age***

A national English-language newspaper that publishes several regional/provincial editions daily (Monday to Friday). This newspaper is not certified by the national Audit Bureau of Circulation but estimated its own daily circulation at 100,000 (*The New Age*, 2016). The newspaper is accompanied by a website, www.thenewage.co.za (*The New Age*, 2016).

The New Age is part of TNA Media, which is owned by the controversial Gupta family that has many business interests in South Africa. The newspaper was established at the end of 2010.

6. ***The Times***

A national newspaper that is published five times a week (Monday to Friday). The distribution figure for this English-language newspaper is 80,666 (Audit Bureau of Circulation, 2016). Articles from this title are also available online at www.timeslive.co.za (Times Live, 2016). The newspaper is part of *The Times* Media Group.

Most of these titles have had designated journalists assigned to the science and technology or health beat during the period under review. However, it is important to note that this research is not an assessment of the individual journalists' work as they were not the sole authors of all the content that were evaluated – many articles were written by other journalists, or sourced from news wire services or other publications.

The content as it appears in the newspaper is the product of the entire news production process of a newspaper (news selection by editors, writing by journalists, editing by subs, and layout by designers) and this assessment is therefore an evaluation of the whole process, rather than any individual person's work.

4.3 Sourcing articles

The articles were sourced from the health news archive of Stellenbosch University's Faculty of Medicine and Health Sciences (FMHS). This archive system, called "Media Review", was updated daily by the FMHS Division of Marketing and Communications where a designated person manually searched newspapers and archived articles on all health-related issues, including new medical research (Rademeyer, 2015).

The daily searches were also supplemented by health-related news items picked up by the South African media monitoring service, Newsclip (Rademeyer, 2015).

Gathered from these two sources, I believe the Media Review to be a fairly exhaustive resource of health-news articles that produced an extensive sample large enough to provide an accurate representation of the standard of articles relating to new medical research that were published in the six respective newspapers during the period under review.

4.4 Review criteria

Each article was reviewed against 10 different criteria that are based on the 10 benchmarks developed by the American health news watchdog, Health News Review. According to their website (Health News Review, 2015), the review criteria consist of 10 different elements that they consider all health care news stories should include. As stated by Health News Review (2015):

> "We think these criteria address the basic issues that consumers need to know in order to develop informed opinions about these interventions – and how/whether they matter in their lives" (Health News Review, 2015).

Articles were therefore rated against the following 10 criteria identified:

Criterion 1: Does the story adequately discuss the cost of the intervention?

Is the cost of a new technology or medication reported and/or gauged against existing treatment? Although it may be difficult to estimate the cost of an experimental approach early in its development phase, articles are expected to at least report the cost of existing treatments and how the new technology is expected to compare.

Criterion 2: Does the story adequately quantify the benefits of the treatment/test/ product/procedure?

Stories are expected to give readers some sense of the scope of the potential benefits. Articles should not rely on patient anecdotes or exaggerate benefits.

Criterion 3: Does the story adequately explain/quantify the harms of the intervention?

Does the article provide details about the potential harm of the treatment/test/product/procedure? These details have to include the severity of the harm, should be based on scientific data, and not rely on patient anecdotes.

Criterion 4: Does the story seem to grasp the quality of the evidence?

Did the article fairly portray the weight of the new scientific data? This includes the size of the study, preliminary or conclusive status of the findings, how the data compares to other research in the same field, and whether or not it is supported by other scientists.

Criterion 5: Does the story commit disease mongering?

Does a story exaggerate or over-sell a condition? This includes turning risk factors into disease, misrepresenting the progression/severity of disease, medicalisation of minor or transient variations in function, medicalisation of normal states, or exaggerating the prevalence of disorder.

Criterion 6: Does the story use independent sources and identify conflicts of interest?

Was an independent expert source quoted (someone not directly connected with the research) and was any potential conflict of interest mentioned?

Criterion 7: Does the story compare the new approach with existing alternatives?

Does the article compare the new treatment/test/product/procedure to existing alternatives or at least mention other options?

Criterion 8: Does the story establish the availability of the treatment/test/product/procedure?
Does the article mention if and where the new technology is available? In the case of a product that is still being developed, is there any indication of when it will become available to the public?

Criterion 9: Was the research peer reviewed?
Does the article mention whether the research underwent peer review, either through publication in a scientific journal or presentation at a scientific conference where the research was evaluated by other experts?

Criterion 10: Does the article rely solely or largely on a news release or content aggregation?
Does the article provide any unique information or were press releases used or other news items reworked to gather information for the article?

4.5 Calculating the results

Measured against the above criteria, each article was awarded a mark out of 10. In instances where all criteria were not applicable to an article, it was not rated on the criteria, and the final mark was recalculated to a mark out of 10, for example, the mark 7 out of 9 would be recalculated as follows 7x10=70 70/9=7.8.

Combined averages were calculated as a mark out of 100.

In addition to providing a rating for individual articles, when combined, these figures provide average ratings for all newspapers, as well as for each individual criteria, elucidating the strengths and weaknesses of health reporting for each of these titles.

The results from this analysis will be discussed in the following chapter.

4.6 Additional information

During the rating process, additional information was collected about the articles that provide insight into the priority each newspaper gave to news about new medical research, as well as their news-gathering processes.

The number of articles and the page number on which each article appeared in each title were noted. This information reveals how much coverage the newspapers gave to new medical research, and how important they deemed it to be.

It was also noted whether the research was conducted locally or internationally, and whether news reports were compiled by a journalist at the newspaper, or sourced from a news agency or aggregated from another news outlet. A newspaper's willingness to spend human resources to report on new medical research could also be an indication of the value a publication ascribes to this genre of news.

Chapter 4 has discussed the research methodology selected to conduct this study, and has given a detailed breakdown of how the newspaper and article selection was conducted. The 10 criteria against which the articles were measured have been described, and an explanation given of how the results were calculated.

The results from the analysis against the 10 criteria of Health News Review will be discussed in Chapter 5.

CHAPTER 5 – RESULTS

The previous chapter explained the research methodology used in this study and the rationale for adopting this approach. Chapter 5 presents the results.

In order to gauge the standard of reporting on new medical research at six South African daily newspapers, a quantitative content analysis was performed on all the articles in this genre for the 12-month period from 1 January 2014 to 31 December 2014.

The results are as follows:

5.1 Number of articles

A total of 489 articles on new medical research were identified in the six South African daily newspapers over the 12-month period under review. This equates to an average of 6.8 articles per publication per month, or 1.7 articles per week.

The Times published the most articles (127) during this period, while *Business Day* published the least (36). Newspapers that published between 90 and 100 articles over the same period are *Cape Times* and *The New Age*, while *Cape Argus* and *Die Burger* published 73 and 63 articles respectively. See Figure 5.1 for a detailed breakdown of the number of articles in each newspaper.

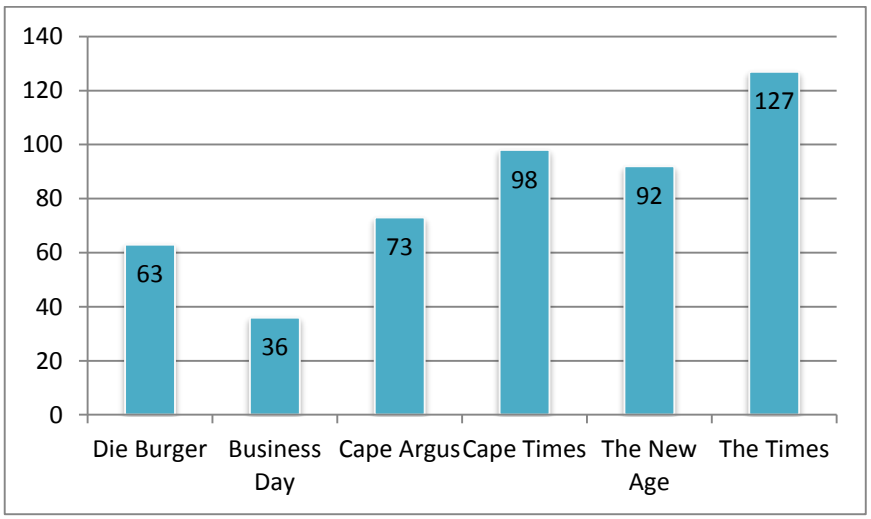

Figure 5.1 - Number of articles per publication

5.2 Placement

The page number on which an article appears in a newspaper reflects the importance given to the news item, i.e. articles placed on the first few pages of a newspaper are considered to be more important than those placed towards the back. According to the mass communication concepts of gatekeeping (McQuail, 2005:556) and agenda-setting (McQuail, 2005:548) the selection of a news item as well as other editorial processes, such as the length of the story and its placement prominence, is indicative of the importance/news value ascribed to the piece by the media institution. According to McQuail (2005:556):

> "Gatekeeping is the general term for the role of initial selection and later editorial processing of event reports in news organizations. News media have to decide what 'events' to admit through the 'gates' of the media on grounds of their 'newsworthiness' and other criteria" (McQuail, 2005:556).

The placement of an article is not only indicative of the value ascribed to it by the news media, but also influences its perceived importance by the audience (McQuail, 2005:548).

> "Agenda-setting is a process of media influence (intended or unintended) by which the relative importance of news events, issues or personages in the public mind are affected by the order of presentation (or relative salience) in news reports. It is assumed that the more the media attention given to a topic, the greater is the importance attributed to it by the news audience" (McQuail, 2005:548).

The average placement of research-related articles for all publications over the entire study period was on page 9.4.

Business Day gave the most prominence (average placement on page 2.7) to articles reporting on new medical research while *The New Age* gave these articles the least prominence (average placement on page 18.8). The placement of articles in ascending order are: *Cape Times* – page 6.5; *The Times* – page 7.2; *Die Burger* – page 8; and *Cape Argus* – page 13 (see Figure 5.2).

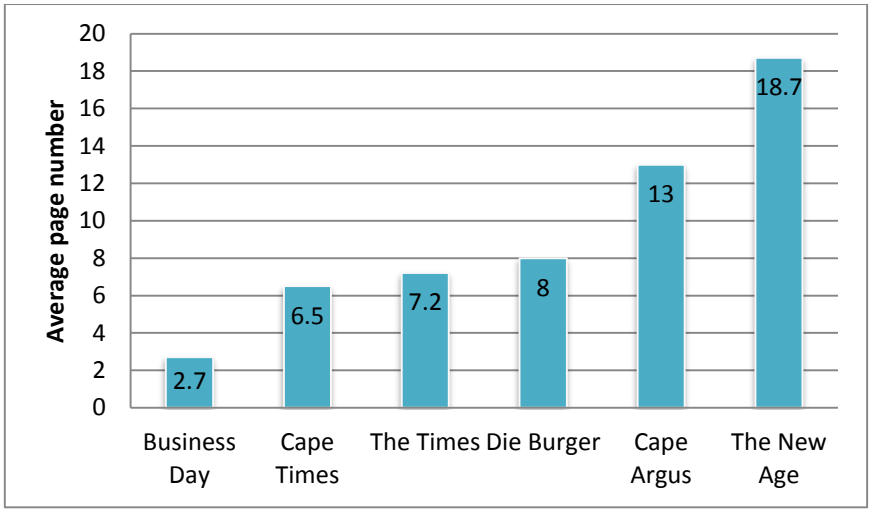

Figure 5.2 - Average page number per publication

5.3 Coverage of local vs international research

The majority of articles (58%) featured international research while the remaining 42% covered medical research performed locally (see Figure 5.3).

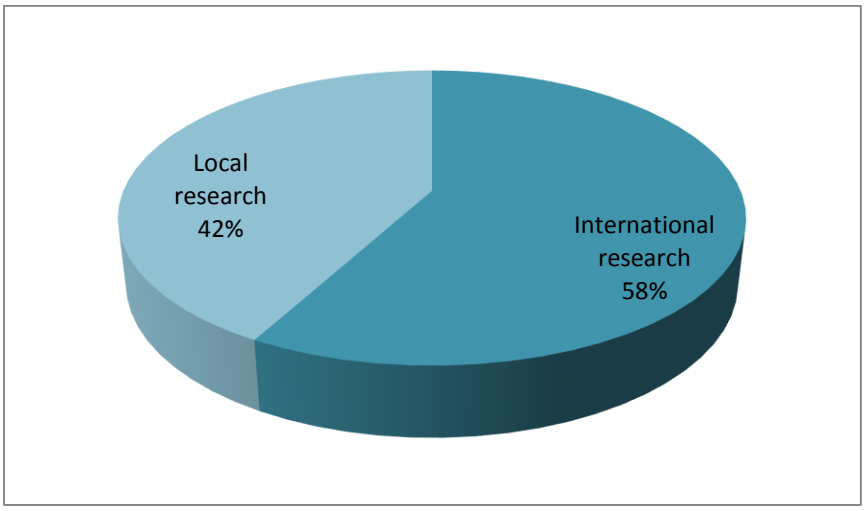

Figure 5.3 - Coverage of local vs international research

The *Cape Argus* gave the most coverage to local research with more than two thirds (68%) of their articles based on researched performed at South African institutions while only 32% were based on international research. *The New Age* gave the least prominence (10%) to local research while focussing largely (90%) on international research. The coverage of local vs international research for the other newspapers is as follows: *Business Day* – 58% local vs 42% international; *Die Burger* – 54% local vs

46% international; *Cape Times* – 38% local vs 62% international; and *The Times* – 22% local vs 78% international.

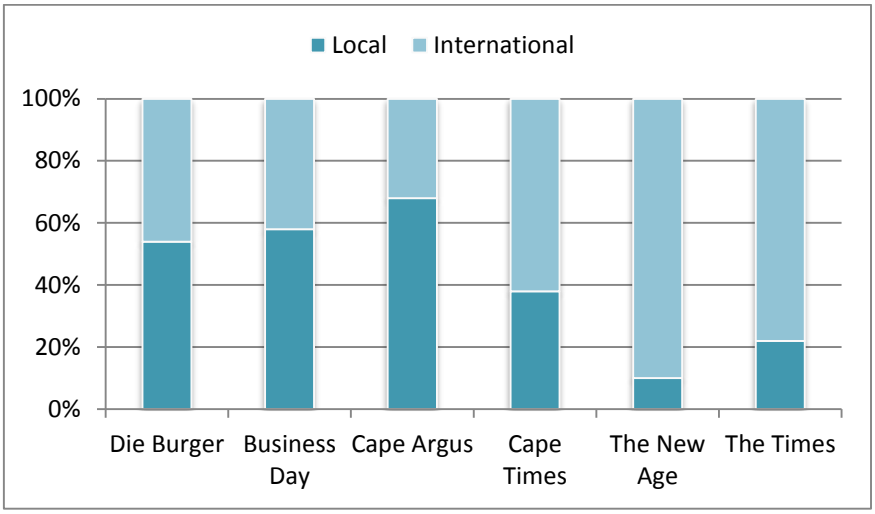

Figure 5.4 - Coverage of local vs international research per newspaper

5.4 Generated internally vs externally

On average, half (50%) of the articles were generated internally i.e. written by a journalist employed by the newspaper, while the other half (50%) were either sourced from news wire services or aggregated from other publications.

The newspaper that generated most of the research-related articles internally was the *Cape Argus* (77%) while *The New Age* internally produced the least articles (10%), aggregating or externally sourcing the bulk (90%) of articles featuring new medical research.

A breakdown of the percentage of articles that were generated internally vs externally for each newspaper are as follows: *Business Day* – 67% internal vs 33% external; *Die Burger* – 75% internal vs 25% external; *Cape Times* – 33% internal vs 67% external; and *The Times* – 22% internal vs 78% external (see Figure 5.5).

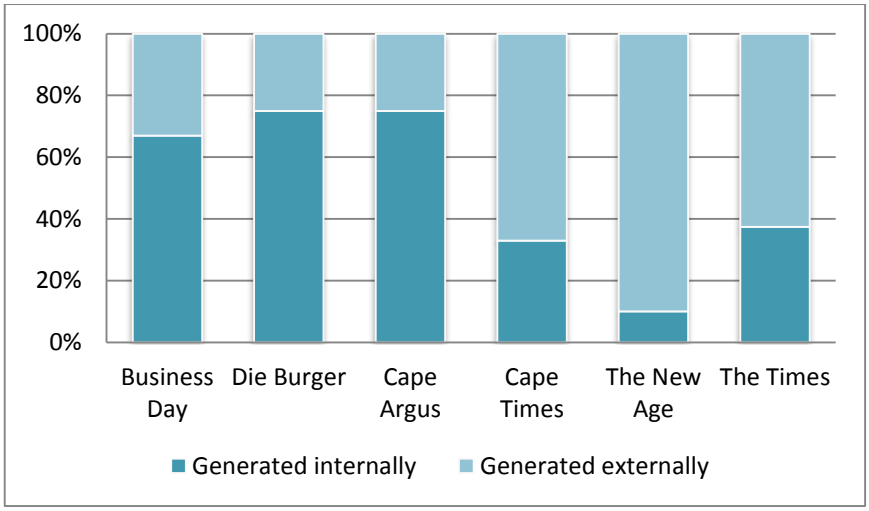

Figure 5.5 - Internally vs externally generated articles per newspaper

5.5 Rating of articles

Measured against the 10 criteria discussed in chapter 4, the average rating per article for all newspapers combined was 61%. However, there was a lot of variation in the scores for the individual criterion, with some criteria generally scoring exceptionally high, while other criteria generally scored very low (see Figure 5.6).

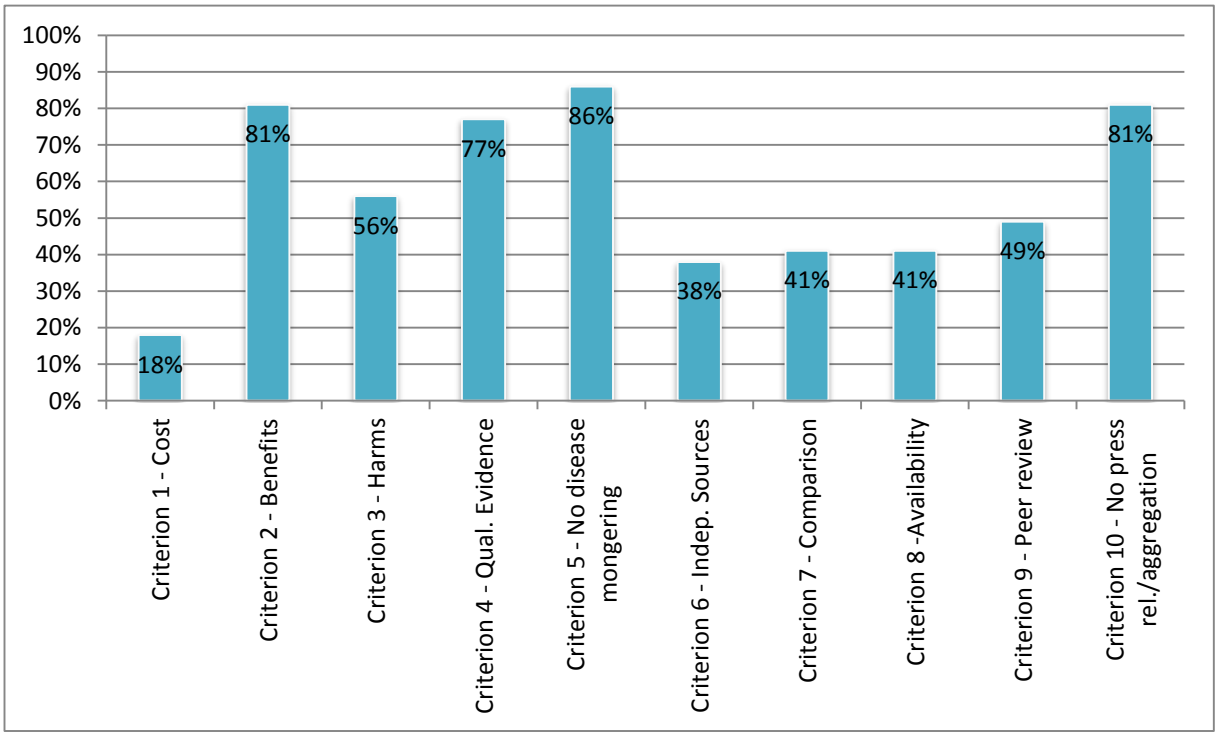

Figure 5.6 - Average rating per criteria

As can

be seen in the graph above, on average the articles scored very well (above 75%) for the following criteria:

- Criterion 2 – Adequately quantifies the benefits of the treatment/research/product (The converse principle for this criterion, Criterion 3 – Adequately explains/quantifies the harm, which scored 56%)
- Criterion 4 – Grasp quality of evidence
- Criterion 5 – Does not show evidence of disease mongering
- Criterion 10 – The article does not rely solely on a news release or content aggregation

On average the articles scored low (below 50%) for the following criteria:

- Criterion 1 – Adequately discussed the cost of intervention
- Criterion 6 – Uses independent sources or identifies conflicts of interest
- Criterion 7 – Compares the new approach to existing approaches
- Criterion 8 – Establishes the availability of the treatment
- Criterion 9 – Indicates whether the research was peer-reviewed

The following pages provide a more detailed breakdown of the individual criterion:

Criterion 1: Does the story adequately discuss the cost of the intervention?

This criterion assesses whether the cost of a new technology or medication was reported and/or gauged against existing treatment.

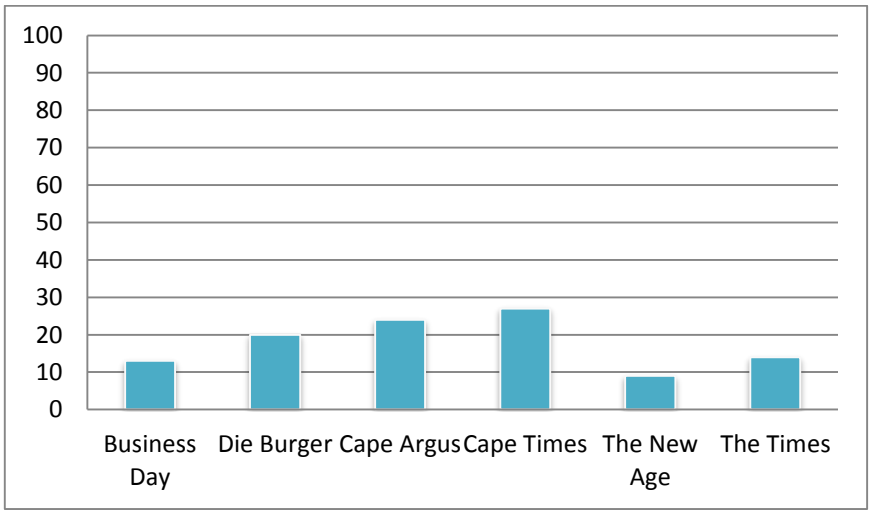

Figure 5.7 - Criterion 1: Does the story adequately discuss the cost of the intervention?

Based on the results in Figure 5.7, all the newspapers performed poorly on this criterion. With only 27%, *Cape Times* had the most articles that complied with this criterion, while the poorest scoring newspaper was *The New Age* which only mentioned the cost and/or gauging the new technology against existing treatments in 9% of its articles.

The four other newspapers scored as follows: *Business Day* – 13%; *Die Burger* – 20%; *Cape Argus* – 24%; and *The Times* – 14%.

Criterion 2: Does the story adequately quantify the benefits of the treatment/test/product/ procedure?

This criterion tests whether articles give readers some sense of the scope of the potential benefits of a new technology or treatment.

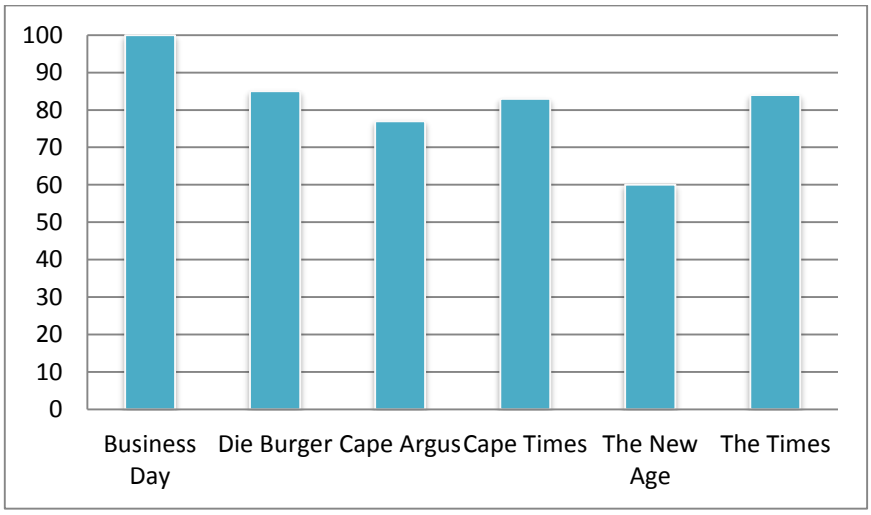

Figure 5.8 - Criterion 2: Does the story adequately quantify the benefits of the treatment/test/product/procedure?

As can be seen in Figure 5.8, all six newspapers scored very well on this criterion with most achieving more than 80%. Each and every *Business Day* article complied with this criterion scoring the publication 100%, while the poorest performer, *The New Age*, achieved 60%.

The four other newspapers scored as follows: *Die Burger* – 85%; *Cape Argus* – 77%; *Cape Times* – 83%; and *The Times* – 84% (See figure 5.8).

Criterion 3: Does the story adequately explain/quantify the harms of the intervention?

Criterion 3 is the converse principle of Criterion 2, and measures whether articles provide details about the potential harm of the treatment/test/product/procedure.

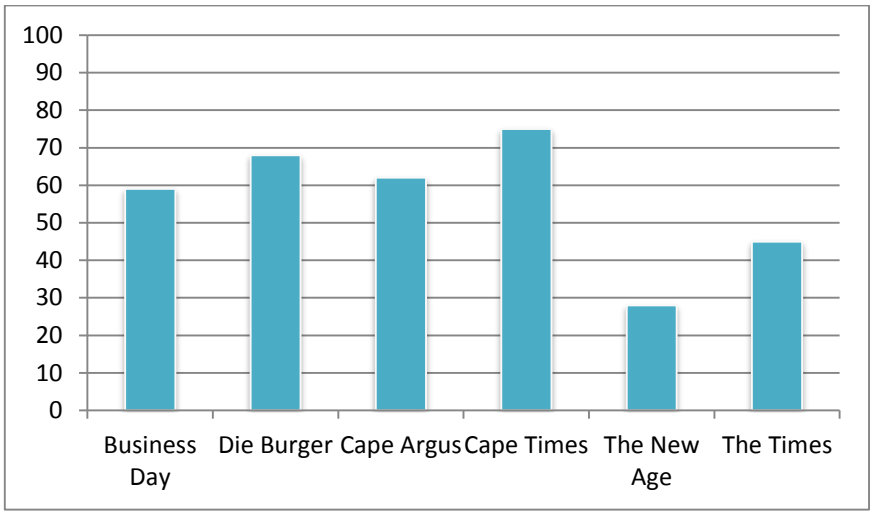

Figure 5.9 - Criterion 3: Does the story adequately explain/quantify the harms of the intervention?

Results in Figure 5.9 show that just more than half (56%) of the articles mentioned any risk or harm related to the new medical interventions. *Cape Times* achieved the highest compliance (75%) with this criterion, while *The New Age* scored the least (28%).

The four other newspapers scored as follows for Criterion 3: *Business Day* – 59%; *Die Burger* – 68%; *Cape Argus* – 62%; and *The Times* – 45% (See figure 5.9).

Criterion 4: Does the story seem to grasp the quality of the evidence?

The aim of this criterion is to establish whether the article gave a fair portrayal of the weight of the new scientific data.

According to the results in Figure 5.10 below, most newspapers scored well on this criterion with most achieving averages well above 70%. More than 90% of the articles in *Business Day* (94%) and *Die Burger* (91%) complied with this criterion. Conversely, only 35% of articles in *The New Age* gave a fair portrayal of the weight of the new scientific data.

The three other newspapers scored as follows: *Cape Argus* – 85%; *Cape Times* – 84%; and *The Times* – 72% (See figure 5.10).

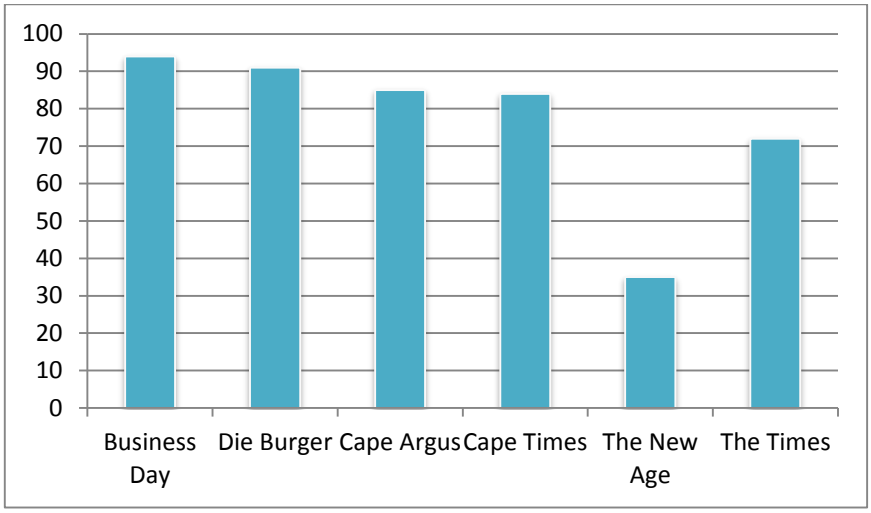

Figure 5.10 - Criterion 4: Does the story seem to grasp the quality of the evidence?

Criterion 5: Does the story commit disease mongering?

This criterion tests whether stories exaggerate or over-sell a condition, for example by turning risk factors into disease or exaggerating the prevalence of a disorder, etc. A high score indicates that a newspaper had committed little disease mongering in its articles.

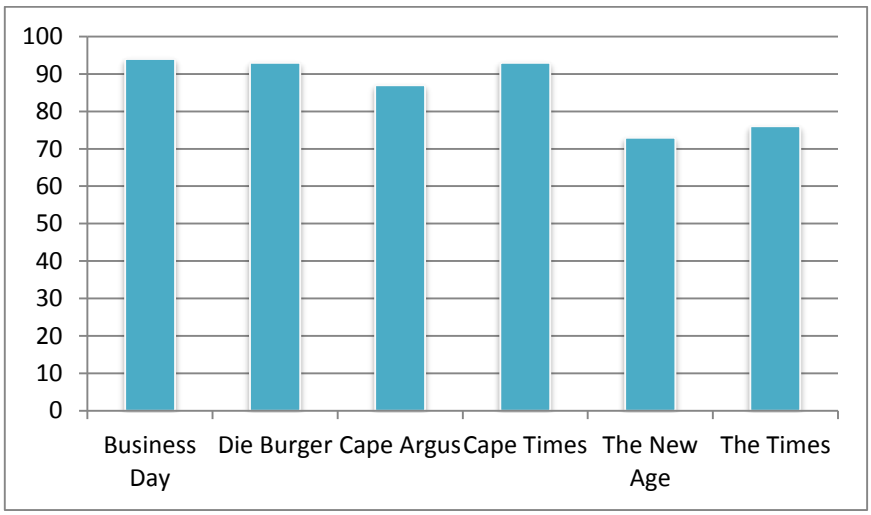

Figure 5.11 - Criterion 5: Does the story commit disease mongering?

According to the results in Figure 5.11, this was the best-performing criterion with all six newspapers scoring an average of 86%. Most of the articles in *Die Burger* (93%), *Business Day* (94%) and *Cape Times* (93%) had no elements of disease mongering, while the newspapers with the lowest compliance still achieved scores in the 70s (*The New Age* with 73% and *The Times* with 76%). The *Cape Argus* scored 87% for Criterion 5.

Criterion 6: Does the story use independent sources and identify conflicts of interest?

This criterion measured whether an independent expert was quoted or if any potential conflict of interest was mentioned.

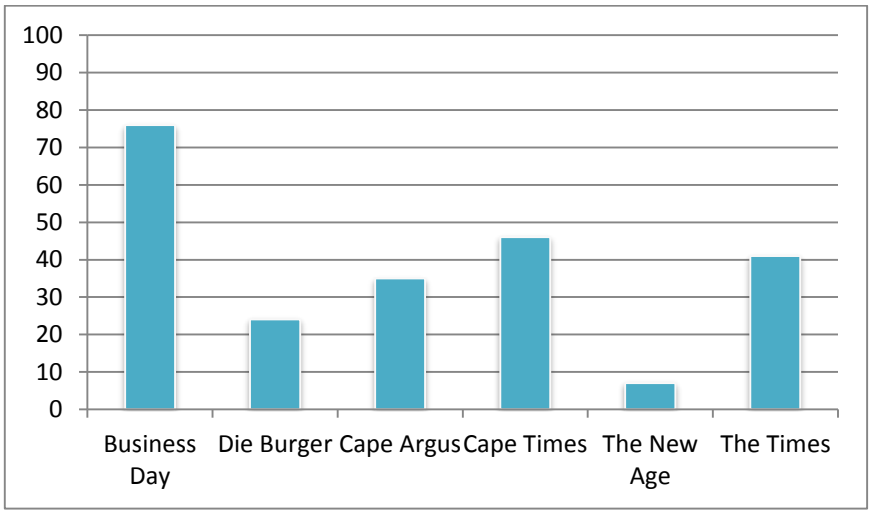

Figure 5.12 - Criterion 6: Does the story use independent sources and identify conflicts of interest?

Based on the results in Figure 5.12, all the newspapers except for *Business Day* (76%) performed poorly on this criterion. Most newspapers only complied with this criterion in about a third of their articles, with the poorest performers being *Die Burger* (24%) and *The New Age* (7%).

The other three newspapers scored as follows for Criterion 6: *Cape Argus* – 35%; *Cape Times* – 46%; and *The Times* – 41% (See figure 5.12).

Criterion 7: Does the story compare the new approach with existing alternatives?

This criterion tests whether articles compared the new treatment or procedure to existing alternatives or at least mentioned other options.

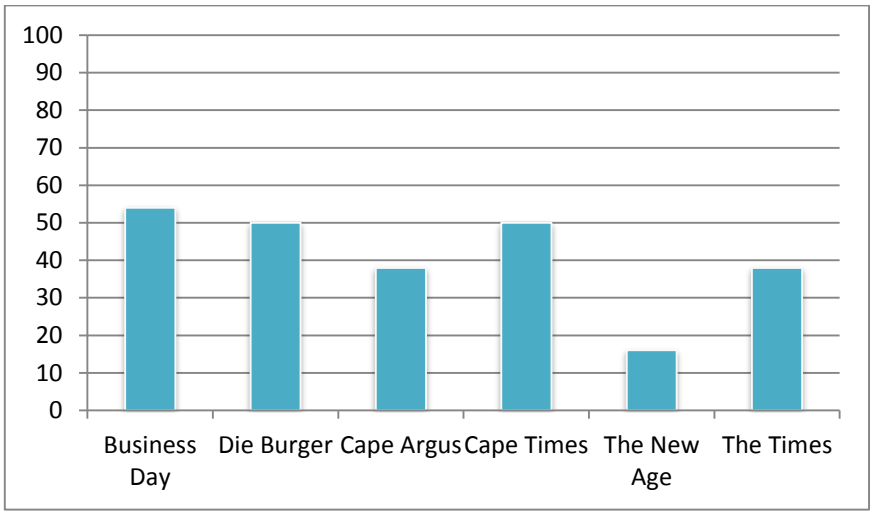

Figure 5.13 - Criterion 7: Does the story compare the new approach with existing alternatives?

All the newspapers scored poorly on this criterion, based on Figure 5.13, with only *Die Burger* (50%), *Business Day* (54%) and *Cape Times* (50%) managing to comply with it in at least half their articles. The lowest score was achieved by *The New Age* (16%), while *Cape Argus* and *The Times* both scored 38% for this criterion.

Criterion 8: Does the story establish the availability of the treatment/test/product/procedure?

The aim of this criterion is to check if the articles mentioned whether the new technology is available to the readers.

According to Figure 5.14 below, newspapers generally performed poorly on this criterion with only *Business Day* (65%) and *Cape Argus* (60%) scoring 60% or above. The lowest performer was *The New Age* (12%) followed by *The Times* (26%). *Die Burger* and the *Cape Times* scored 52% and 31% respectively.

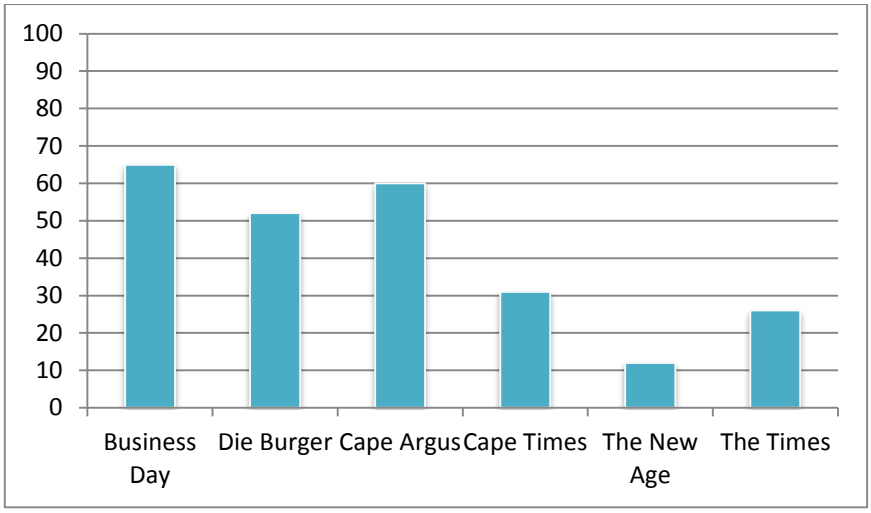

Figure 5.14 - Criterion 8: Does the story establish the availability of the treatment/test/product/procedure?

Criterion 9: Was the research peer reviewed?

This criterion tests whether the research that was reported on, underwent any peer-review process.

The results from the measurement of the articles against this criterion appear below, and with the exception of *Business Day* (79%) and *Cape Argus* (61%) no other newspaper complied with this criterion in at least half of their articles. With not even a quarter of articles complying with this criterion, *The New Age* achieved the lowest score (24%).

The three other newspapers scored as follows: *Die Burger* – 45%; *Cape Times* – 45%; and *The Times* – 44% (See figure 5.15).

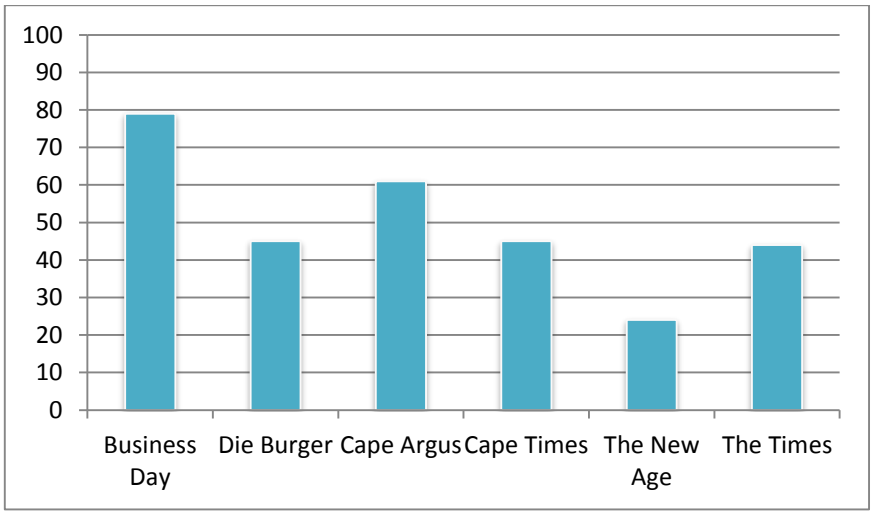

Figure 5.15 - Criterion 9: Was the research peer reviewed?

Criterion 10: Does the article rely solely or largely on a news release or content aggregation?

This criterion aims to establish whether the articles provided any unique information or if the journalist mainly relied on press releases or other reworked news items to gather information for the article.

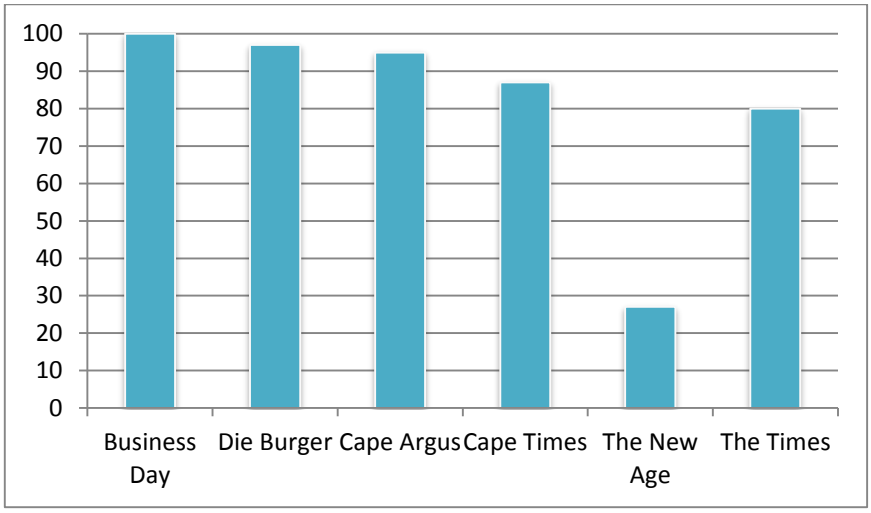

Figure 5.16 - Criterion 10: Does the article rely solely or largely on a news release or content aggregation?

According to Figure 5.16, most newspapers, except for *The New Age* (27%) scored well against this criterion. *Business Day* achieved full marks (100%) while *Die Burger* (97%) and *Cape Argus* (95%) also performed particularly well. The *Cape Times* and *The Times* scored 87% and 80% respectively.

5.6 Regional vs national newspapers

On average the three regional newspapers in the Western Cape scored considerably higher (67% on average per article) on the 10 criteria discussed above than the three national newspapers, which scored 55% on average per article. Although the best performing newspaper, *Business Day* with an average rating of 79% per article, falls within the group of national newspapers, the average for this group is considerably lower due to the poorest performing newspaper, *The New Age*, which scored only 31% per article on average.

The standard health news reporting was very similar at all three regional newspapers in the Western Cape with *Die Burger* at 66%; *Cape Argus* at 68%; and *Cape Times* at 67%.

This concludes the breakdown of results. The next chapter will discuss the conclusions drawn from the above findings.

CHAPTER 6 - DISCUSSION AND CONCLUSIONS

In this chapter the research findings discussed in Chapter 5 will be critically analysed in order to develop practical recommendations that could raise the standard of news reporting on new medical research at the six South African daily newspapers that were included in this study.

6.1 General use and content of the articles

The number of articles reporting on new medical research that were published in the different newspapers over the 12-month period under review varied widely. For example, the newspaper with the lowest number of articles (*Business Day*, 36 articles) placed less than a third of the number of articles that the newspaper with the highest number of articles (*The Times*, 127 articles) published. There were also considerable differences between the number of articles published in the other four newspapers included in the study: *Die Burger* – 63 articles; *The New Age* – 92 articles; *Cape Argus* – 73 articles; and *Cape Times* – 98 articles.

The age-old debate of "quantity versus quality" seems applicable to this study as there was some correlation between the number of articles published and the quality of the work (see Figure 6.1). The newspaper that published the least number of articles (*Business Day*) had by far the highest average rating (79%) per article, while the newspaper with the highest number of articles (*The Times*) had the second poorest average rating per article (56%). The newspaper with the poorest average rating per article (*The New Age* with 31%) also published a fairly high number of articles (92).

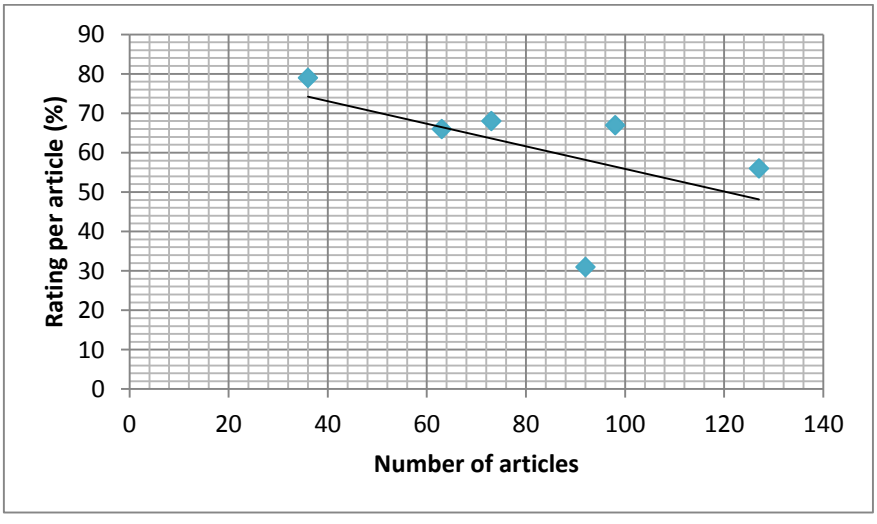

Figure 6.1 - Relationship between the number of articles and the average rating per article

This inverted trend seems also to apply to the prominence of placement of the articles in each newspaper: the newspaper that published the least number of articles (*Business Day*), gave by far the

most prominence to articles related to new medical research, on average placing them on page 2.7. On several occasions *Business Day* even featured these articles as front page news (see Figure 6.2 below).

Most of the articles in the other publications included in this study were placed on page 7 or further back, with one outlier (*The New Age*) which placed the articles related to new medical research on average on page 19. Based on this finding, the conclusion can be drawn that at five out of the six newspapers, news of new medical research is not given high priority.

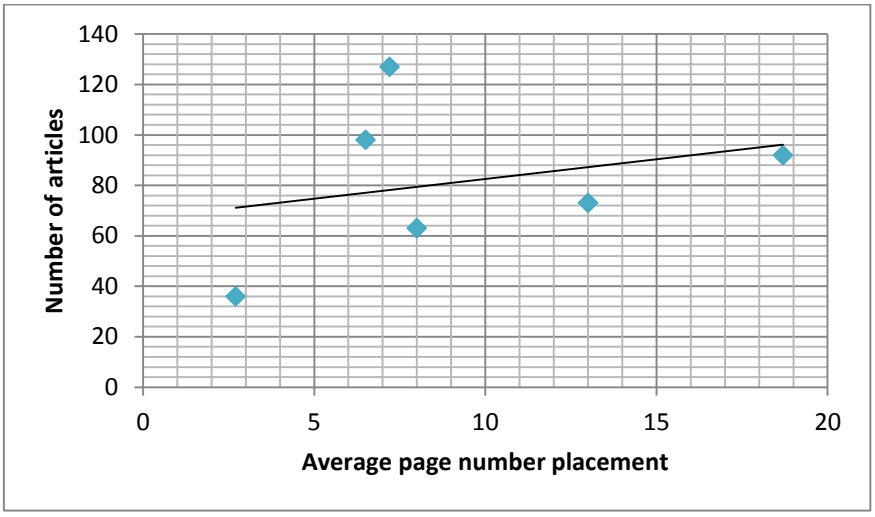

Figure 6.2 - Relationship between number of articles and page placement

Half of the newspapers (*Business Day*, *Die Burger* and *Cape Argus*) gave more coverage to local research while the other half (*Cape Times*, *The New Age* and *The Times*) gave preference to international research. There is a strong correlation between the coverage of local versus international research and whether or not articles were written in-house, or sourced externally.

Articles about local research were often written by journalists at the newspaper, while articles featuring international research were generally sourced externally (taken from news wire services or aggregated from other publications).

It is also of interest that most newspapers with dedicated health or science and technology journalists were generally the newspapers that covered more local than international research than those without a journalist dedicated to this genre.

Interestingly there is a positive relationship between the average rating per article and internally generated articles (see Figure 6.3).

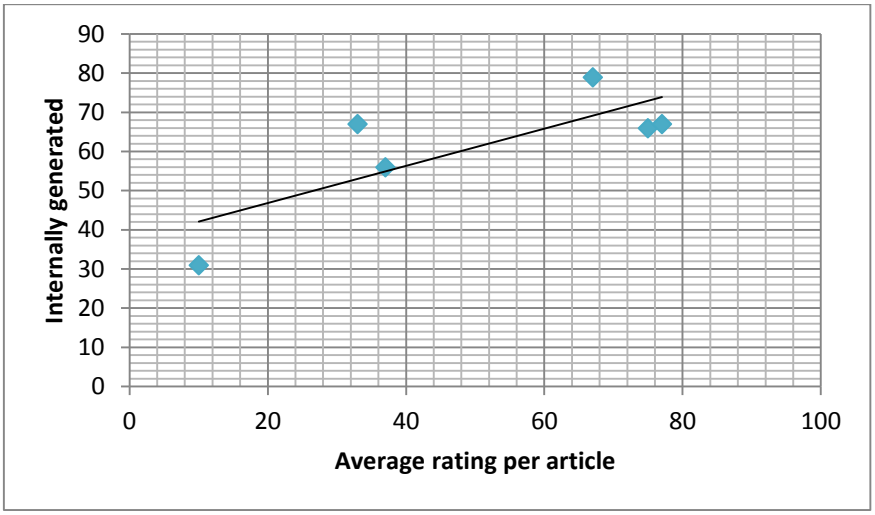

Figure 6.3 - Relationship between rating per article and internally generated articles

The findings suggest that articles that are produced in-house are generally of better quality than those that were sourced externally or where the content was aggregated. This could be ascribed to a fair standard of reporting from local journalists, and/or it could reflect on the news selection and preparation processes by people other than journalists (news editors or sub editors) who might select articles of poor quality or cut important information from the articles during the editing process.

The latter was the case with a specific article taken from a news wire service and used in two separate publications. Although it was the exact same article (it had the same author and was taken from the same news wire), the two newspapers scored differently for the article as valuable information that added to its scientific credibility was edited out of one of the articles during the sub-editing process.

This case study highlights the need not just for journalist but for other newsroom staff members involved in the news selection and preparation process, such as news editors, sub editors and proof readers to also be informed and have knowledge of the basic principles of science writing, and not just journalists.

6.2 Article rating

The average rating per article for all newspapers on all criteria over the 12-month period under review was 61%. However, variation between individual criteria differed widely indicating that in general the publications scored either very well or very poorly for a criterion (see Figure 6.4).

On average the articles scored very well (above 75%) for the following criteria:

- Criterion 2 – Quantify benefits
- Criterion 4 – Grasp quality of evidence
- Criterion 5 – Does not commit disease mongering
- Criterion 10 – Article does not rely solely on news release

On average the articles scored low (below 50%) for the following criteria:

- Criterion 1 – Discuss cost
- Criterion 6 – Independent sources/conflict of interest
- Criterion 7 – Compare to existing approaches
- Criterion 8 – Availability of treatment
- Criterion 9 – Was research peer reviewed

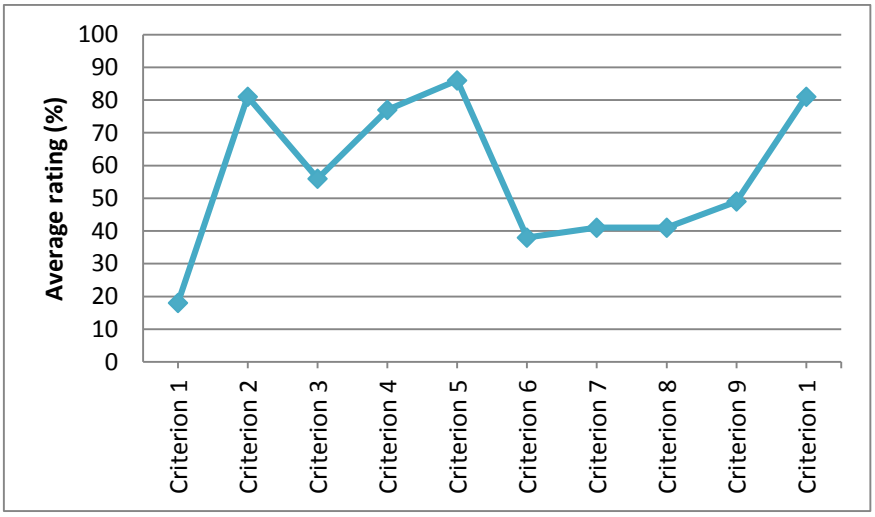

Figure 6.4 – Varied ratings scored per criteria

All the newspapers assessed in this study scored very poorly (average of 18%) for Criterion 1 (Does the story adequately discuss the cost of the intervention?). This finding suggests that all the newspapers that were analysed failed to provide sufficient information in the articles, leaving readers unable to

gauge whether or not the new intervention could add value to his/her life as the cost of a treatment is often indicative of how accessible it is to the public.

Criterion 8 (Does the story establish the availability of the treatment/test/product/procedure?) also relates to whether the article accurately portrays the accessibility and value of this research to the reader. An average score of only 41% across all the newspapers suggests that the majority of the articles failed to inform readers whether the intervention would be available and accessible to them.

Also relating to the value a new intervention can offer the reader is Criterion 7 (Does the story compare the new approach with existing alternatives?), for which all the newspapers also scored poorly (41% average). Without comparing the new intervention against some benchmark within the reader's frame of reference, it is difficult to develop a clear understanding of the true value of a new intervention.

Low scores on Criteria 1, 7 and 8 (see Figure 6.4) suggest that more often than not these newspapers failed to inform readers of how accessible the medication or technology discussed in the article was to them (either through cost or availability), and by not benchmarking the new intervention against existing products, the article also failed to give readers a clear grasp of the difference the research can make to their lives.

Criterion 2 (Does the story adequately quantify the benefits of the treatment/test/product/procedure?) is closely linked to Criterion 3 (Does the story adequately explain/quantify the harms of the intervention?) as a balanced news article would require an explanation of both the benefits and the harms or risks of a new medical intervention.

A clear disconnect between the average rating for Criterion 2 (81%) and Criterion 3 (56%) suggests that articles generally reported positively about new interventions by highlighting the benefits and downplaying any harms or risks (see Figure 6.5).

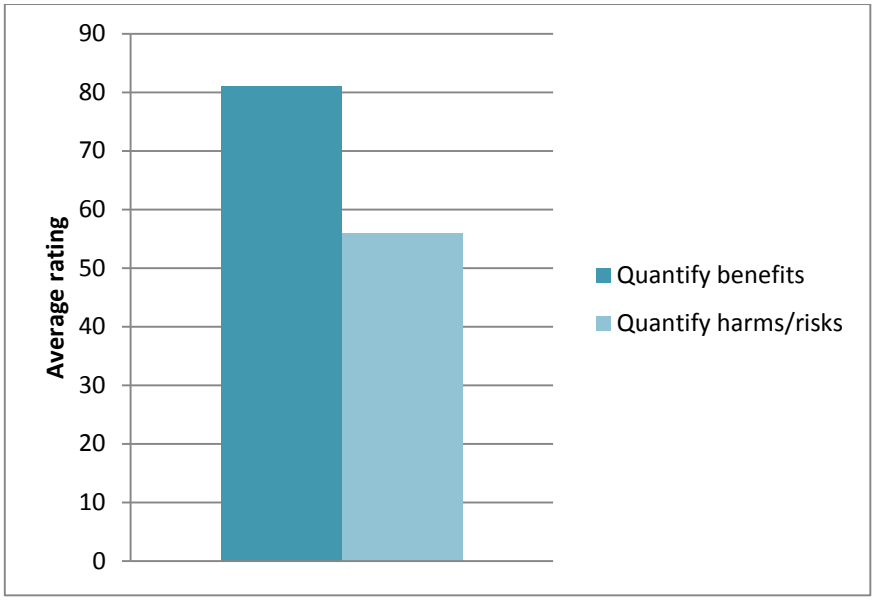

Figure 6.5 – More articles highlighted benefits (Criterion 2) than the risks or harms (Criterion 3) of a new intervention

This finding also relates to Criterion 6 (Does the story use independent sources and identify conflicts of interests?) for which most newspapers scored poorly (38% on average). Quoting an independent source is an informal form of "peer review" that can provide insight to the reader on whether the new intervention is accepted or rejected by the majority of the scientific community. By not quoting independent sources or mentioning conflicts of interest, the research findings go untested and the article fails to verify information provided by sources with potential vested interests.

This form of unbalanced reporting may result in unrealistic expectations of a treatment or medication, which could create false hope for patients (see Figure 6.6).

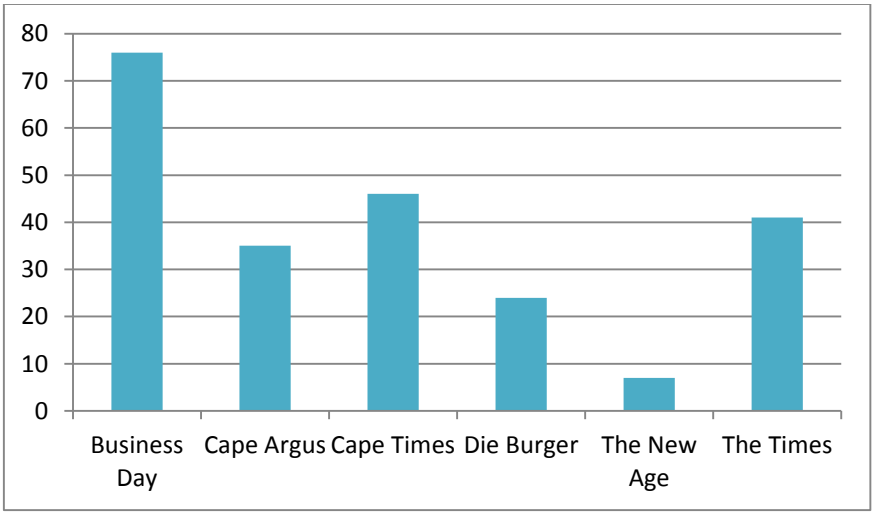

Figure 6.6 – Quoting independent sources or mentioning conflicts of interests

A heartening finding was that more than three quarters of all the articles (77%) seemed to grasp the quality of the research being reported on (Criterion 4: Does the story seem to grasp the quality of the evidence?). In general, the research was not presented as more important than it actually was and aspects such as the size of the study, or whether it was preliminary or conclusive data, were mentioned.

All the newspapers scored well (86% average) on Criterion 5 (Does the story commit disease mongering?) showing that most articles did not exaggerate the risk or severity of diseases but rather gave a fair portrayal of the relevant illness, its risks and/or symptoms (see Figure 6.7).

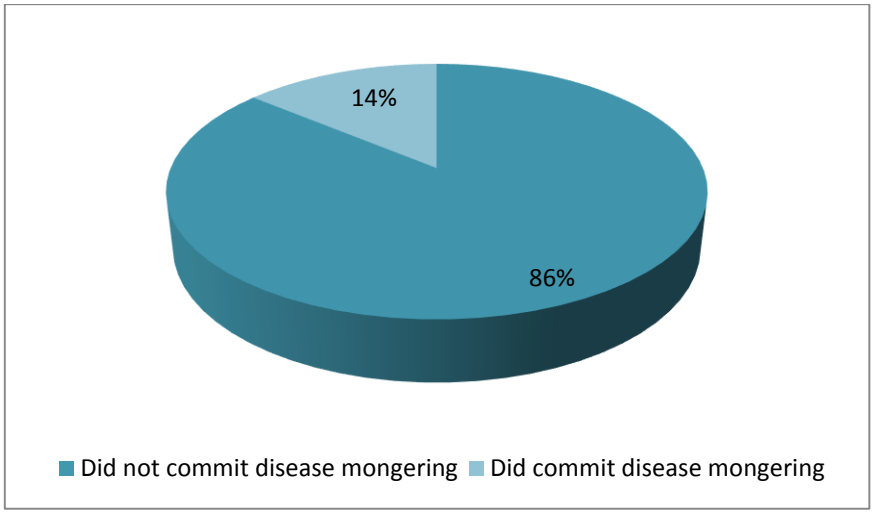

Figure 6.7 - Most articles did not commit disease mongering (Criterion 5)

Slightly less than half of all the articles (49%) explicitly indicated that the research being reported on underwent some kind of peer-review process (Criterion 9) (See Figure 6.8). It is expected that more of the articles were reporting on peer-reviewed research, but that the article failed to mention this aspect in the text.

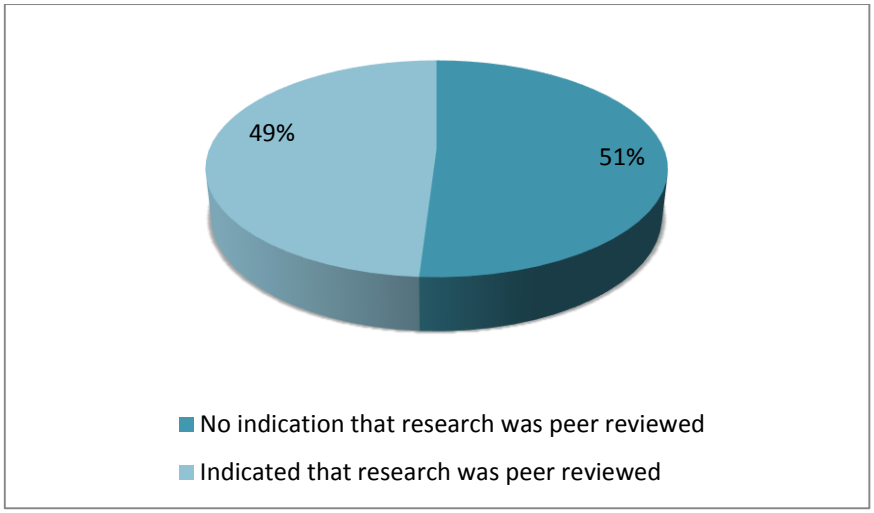

Figure 6.8 - Less than half of the articles indicated that research was peer reviewed (Criterion 9)

As discussed in Chapter 2, untested science is unreliable and by publicising it a newspaper risks promoting inaccurate- or pseudoscience, which can potentially harm its readers if they act on the information contained in the article, either by negatively impacting on their health, or on their finances should they spend money on an ineffective or partially effective product.

All but one newspaper (*The New Age* with 27%) scored well (81% on average) on the last measurement (Criterion 10: Does the article rely solely or largely on a news release or content aggregation?). This indicates that in most cases, articles seemed to be based on original content rather than merely repeating or reproducing a press release or other source of information. This number includes articles sourced from news wire services, but rather indicates articles explicitly aggregated from press releases or other news sources.

However, without access to all press release material, this criterion was difficult to gauge and a negative mark could only be awarded in cases where content was obviously aggregated.

6.3 Conclusions and recommendations

It is significant that the articles produced by local journalists compared well to articles sourced from international wire services, and could serve as a motivation for newspapers to employ/assign journalists to exclusively report on the health/science beat.

The newspapers that were assessed fared well on some very important basic principles of science reporting, such as grasping the quality of evidence and avoiding disease mongering, but much more could be done to improve the standard of reporting on new medical research.

Some of these improvements include that: news articles need to engage more critically with new research by highlighting the benefits as well as the risks of a new medication or technology, add comments from independent sources, and ensure that they only report on research that has undergone peer review.

Journalists must also do more to inform readers about the accessibility and the true value of new research, by discussing availability and cost of the new intervention and by benchmarking it to other existing therapies.

It is also likely to benefit the standard of health/science reporting if all newsroom staff members involved in the news selection and production processes have some basic knowledge of what a good science story requires.

6.4 Limitations to this research

The 10 criteria chosen for this study were based on an American model catering for the innovative type of research mostly performed in the developed world (for example drug and device development). During the data-collection process this researcher realised that the criteria lacked questions aimed at epidemiological research (that looks at the prevalence of disease) that is very common in a developing country such as South Africa.

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APPENDIX 1 – DATA SHEETS

A monthly numeric breakdown of how each newspaper scored per criteria and other information gathered for the study.

1. *Business Day* – 1 January 2014 to 31 December 2014

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	4	6	3	3	5	1	4	1	2	1	4	2	36	3
Average page number of articles														
	2.5	1	1.3	4	1.7	3	2.5	1	7	3	3.3	2.5	N/A	2.7
Local vs international coverage (percentage %)														
Local	25	33	33	67	30	100	37	100	50	100	25	100	N/A	58
Int.	75	67	67	33	70	0	63	0	50	0	75	0	N/A	42
Internally vs externally generated (percentage %)														
Intern.	25	33	33	100	40	100	50	100	50	100	75	100	N/A	67
Extern.	75	67	67	0	60	0	50	0	50	0	25	0	N/A	33
Average rating per article (percentage %)														
	73	80	65	97	80	100	75	88	45	78	71	92	N/A	79
Rating per criteria (percentage %)														
Crit. 1	0	20	0	100	0	-	0	0	0	-	0	-	N/A	13
Crit. 2	100	100	100	100	100	-	100	100	100	100	100	100	N/A	100
Crit. 3	75	83	33	100	60	100	67	-	0	0	67	-	N/A	59
Crit. 4	75	83	100	100	100	100	100	100	100	100	75	100	N/A	94
Crit. 5	100	100	50	100	100	100	100	100	100	100	75	100	N/A	94
Crit. 6	75	100	67	100	100	100	25	100	50	100	50	50	N/A	76
Crit. 7	75	50	0	67	50	100	50	100	0	0	100	-	N/A	54
Crit. 8	67	67	33	100	80	100	50	-	0	100	50	-	N/A	65
Crit. 9	75	67	100	100	60	100	75	100	0	100	75	100	N/A	79
Crit. 10	100	100	100	100	100	100	100	100	100	100	100	100	N/A	100

2. *Die Burger* – 1 January 2014 to 31 December 2014

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	6	1	8	4	6	8	7	8	8	1	3	3	63	5.3
Average page number of articles														
	8.3	-	10	7.5	5.2	7.5	6.7	11.1	6.8	9	9.7	5.7	N/A	7.9
Local vs international coverage (percentage %)														
Local	42	100	50	25	33	75	50	94	50	0	67	67	N/A	54
Int.	58	0	50	75	67	25	50	6	50	100	33	33	N/A	46
Internally vs externally generated (percentage %)														
Intern.	33	100	88	100	100	75	86	100	56	0	67	100	N/A	75
Extern.	67	0	12	0	0	25	14	0	44	100	33	0	N/A	25
Average rating per article (percentage %)														
	57	60	60	83	72	65	79	58	68	40	72	81	N/A	66.3
Rating per criteria (percentage %)														
Crit. 1	0	0	25	0	0	20	100	25	-	0	33	-	N/A	20
Crit. 2	100	100	67	67	100	80	100	83	33	100	100	-	N/A	85
Crit. 3	66	100	38	67	83	57	71	83	80	0	-	100	N/A	68
Crit. 4	66	100	100	75	83	100	100	63	100	100	100	100	N/A	90
Crit. 5	83	100	88	100	83	88	100	100	75	100	100	100	N/A	93
Crit. 6	17	0	0	75	33	25	57	38	13	0	0	33	N/A	25
Crit. 7	40	0	57	75	60	60	80	50	33	0	50	100	N/A	50
Crit. 8	75	100	80	100	60	50	0	14	50	0	100	0	N/A	52
Crit. 9	33	0	25	100	67	38	71	13	75	0	50	67	N/A	45
Crit. 10	66	100	100	100	100	100	100	100	100	100	100	100	N/A	97

3. *Cape Argus* – 1 January 2014 to 31 December 2014

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	1	3	6	8	8	7	10	8	10	5	5	2	73	6.1
Average page number of articles														
	19	11.7	15.3	16	13.6	12.1	10.8	8.2	12.4	14	14.4	9.5	N/A	13.1
Local vs international coverage (percentage %)														
Local	100	100	58	50	100	86	75	100	50	40	10	50	N/A	68
Int.	0	0	42	50	0	14	25	0	50	60	90	50	N/A	32
Internally vs externally generated (percentage %)														
Intern.	-	100	83	50	100	100	100	100	40	40	10	100	N/A	75
Extern.	-	0	17	50	0	0	0	0	60	60	90	0	N/A	25
Average rating per article (percentage %)														
	55	78	63.7	52.6	56.1	77.3	77.4	77.3	62.7	70.6	74.2	68	N/A	68
Rating per criteria (percentage %)														
Crit. 1	10	0	0	0	33	100	0	-	50	-	50	0	N/A	24
Crit. 2	100	33	75	57	50	100	100	80	63	67	100	100	N/A	77
Crit. 3	0	67	60	43	43	71	75	100	71	75	75	-	N/A	62
Crit. 4	100	100	83	50	88	100	80	100	80	40	100	100	N/A	85
Crit. 5	100	100	67	63	86	71	100	100	78	100	75	100	N/A	87
Crit. 6	0	67	0	38	13	43	50	50	20	60	80	0	N/A	35
Crit. 7	0	50	50	40	50	75	71	25	43	0	50	0	N/A	38
Crit. 8	100	100	40	67	33	50	67	67	0	100	0	100	N/A	60
Crit. 9	-	100	67	63	29	71	80	50	60	60	40	50	N/A	61
Crit. 10	100	67	100	75	100	100	100	100	100	100	100	100	N/A	95

4. *Cape Times* – 1 January 2014 to 31 December 2014

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	8	6	5	1	12	9	11	10	9	13	7	7	98	8.2
Average page number of articles														
	7	7.2	5	6	6	6.3	5.3	8.2	7	5.6	7.8	6.7	N/A	6.5
Local vs international coverage (percentage %)														
Local	12	17	40	100	29	22	50	50	44	15	43	29	N/A	38
Int.	88	83	60	0	71	78	50	50	56	85	57	71	N/A	62
Internally vs externally generated (percentage %)														
Intern.	6	0	40	100	36	22	45	50	56	8	14	14	N/A	33
Extern.	94	100	60	0	64	78	55	50	44	92	86	86	N/A	67
Average rating per article (percentage %)														
	44.9	55.5	65.6	88	66	68.6	72.7	73.1	58.4	66.4	70.6	73.1	N/A	67
Rating per criteria (percentage %)														
Crit. 1	0	67	33	-	25	0	100	0	0	20	25	33	N/A	28
Crit. 2	75	60	67	10	86	71	100	71	63	100	100	100	N/A	83
Crit. 3	57	83	80	10	45	88	78	88	83	50	75	75	N/A	75
Crit. 4	50	83	100	10	92	89	73	90	44	92	100	100	N/A	84
Crit. 5	100	83	100	10	92	78	91	100	80	88	100	100	N/A	93
Crit. 6	25	17	60	10	50	33	55	50	56	23	57	29	N/A	46
Crit. 7	13	0	25	10	80	86	63	44	14	44	50	80	N/A	50
Crit. 8	25	33	0		50	100	0	40	0	50	25	20	N/A	31
Crit. 9	38	67	40	0	50	56	50	60	56	54	17	57	N/A	45
Crit. 10	38	50	100	10	75	78	100	100	100	100	100	100	N/A	87

5. *The New Age* – 1 January 2014 to 31 December 2014

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	4	16	6	5	7	21	9	3	3	8	7	3	92	7.7
Average page number of articles														
	2	3.6	10.3	26.3	13.8	26.5	26.4	17	26.3	24	21.9	27	N/A	18.8
Local vs international coverage (percentage %)														
Local	0	0	0	0	14	5	11	33	33	0	21	0	N/A	10
Int.	100	100	100	100	86	95	89	67	67	100	79	100	N/A	90
Internally vs externally generated (percentage %)														
Intern.	0	0	0	0	29	5	11	33	33	0	14	0	N/A	10
Extern.	100	100	100	100	71	95	89	67	67	100	86	100	N/A	90
Average rating per article (percentage %)														
	9.3	29.2	14.5	29	29.1	27.1	33.4	46	47	28.4	38.9	35	N/A	31
Rating per criteria (percentage %)														
Crit. 1	0	0	0	25	0	14	0	0	0	40	25	0	N/A	9
Crit. 2	0	45	50	75	50	71	80	100	67	57	67	67	N/A	60
Crit. 3	50	19	0	0	50	17	50	0	50	17	17	67	N/A	28
Crit. 4	0	31	0	20	29	10	22	100	67	25	43	67	N/A	35
Crit. 5	33	93	67	75	71	94	63	100	100	60	86	33	N/A	73
Crit. 6	0	6	0	20	14	5	11	0	0	13	14	0	N/A	7
Crit. 7	0	27	0	25	0	12	29	33	0	14	0	50	N/A	16
Crit. 8	0	20	0	33	0	25	0	33	0	17	20	0	N/A	12
Crit. 9	0	18	33	40	29	24	22	33	67	13	14	0	N/A	24
Crit. 10	0	6	0	20	29	14	22	67	67	25	71	0	N/A	27

6. *The Times* – 1 January 2014 to 31 December 2014

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	4	11	12	11	5	11	17	9	17	19	9	2	127	10.6
Average page number of articles														
	8.3	9.6	7.4	5.6	6.1	6.6	7.2	5.3	5.8	9.5	9.6	5.5	N/A	7.2
Local vs international coverage (percentage %)														
Local	0	14	17	18	20	32	26	33	24	24	33	25	N/A	22
Int.	100	86	83	82	80	68	74	67	76	76	67	75	N/A	78
Internally vs externally generated (percentage %)														
Intern.	0	27	25	36	60	36	47	56	35	32	44	50	N/A	37
Extern.	100	73	75	64	40	64	53	44	65	68	56	50	N/A	63
Average rating per article (percentage %)														
	32.5	47.8	56.3	62.7	66.4	66.7	59.9	66.9	63.4	46.5	48	57.5	N/A	56
Rating per criteria (percentage %)														
Crit. 1	0	14	0	14	0	40	9	14	0	0	25	50	N/A	14
Crit. 2	100	89	50	100	75	78	93	100	79	69	75	100	N/A	84
Crit. 3	0	56	67	30	80	67	38	67	60	47	25	0	N/A	45
Crit. 4	25	73	83	91	80	73	75	89	71	47	56	100	N/A	72
Crit. 5	100	91	50	91	50	91	88	86	67	80	71	50	N/A	76
Crit. 6	25	18	50	55	60	45	41	56	41	32	22	50	N/A	41
Crit. 7	0	0	50	50	67	43	46	33	53	29	33	50	N/A	38
Crit. 8	0	17	0	44	0	50	50	50	33	27	40	0	N/A	26
Crit. 9	25	46	50	30	60	55	54	50	71	32	56	0	N/A	44
Crit. 10	50	36	75	100	100	91	82	100	100	63	67	100	N/A	80

7. Combined results of all newspapers studied– 1 January 2014 to 31 December 2014

A monthly numeric breakdown of how all newspaper combined scored per criteria and other information gathered for the study.

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Ave
Average number of articles														
	4.5	7.2	6.7	5.3	7.2	9.5	9.7	6.5	8.2	7.8	5.8	3.2	N/A	6.8
Actual number of articles														
	27	43	40	32	43	57	58	39	49	47	35	19	489	N/A
Average page number of articles														
	8.3	6.6	8.2	10.9	7.7	10.3	9.8	8.5	10.9	10.9	11.1	9.5	N/A	9.4
Local vs international coverage (percentage %)														
Local	30	44	33	43	38	53	42	68	42	30	33	45	N/A	42
Int.	70	56	67	57	62	47	58	32	58	70	67	55	N/A	58
Internally vs externally generated (percentage %)														
Intern.	27	44	45	64	61	56	57	73	45	30	37	60	N/A	50
Extern.	73	56	55	36	39	44	43	27	55	70	63	40	N/A	50
Average rating per article (percentage %)														
	45.3	58.3	54.2	68.8	61.6	67.5	66.2	68.3	57.3	55	62.6	67.7	N/A	61
Rating per criteria (percentage %)														
Crit. 1	1.6	16.8	9.6	27.8	9.7	34.8	34.9	7.8	10	15	26.3	20.8	N/A	18
Crit. 2	79.2	71.2	68.2	83.2	76.8	80	95.5	89	67.5	82.2	90.3	93.4	N/A	81
Crit. 3	41.3	68	46.3	56.7	60.2	66.7	63.2	67.6	57.3	31.5	51.8	60.5	N/A	56
Crit. 4	52.7	78.3	77.7	72.7	78.7	78.8	75	90.3	77	67.3	79	94.5	N/A	77
Crit. 5	86	94.5	70.3	88.2	80.3	87	90.3	97.7	83.3	88	84.5	80.5	N/A	86
Crit. 6	23.6	34.7	29.5	64.7	45	41.8	39.8	49	30	38	37.2	27	N/A	38
Crit. 7	21.3	21.2	30.3	59.5	51.2	62.7	56.5	47.5	23.8	14.5	47.2	56	N/A	41
Crit. 8	44.5	56.2	25.5	68.8	37.2	62.5	27.8	40.8	13.8	49	39.2	24	N/A	41
Crit. 9	34.2	49.7	52.5	55.5	49.2	57.3	58.7	51	54.8	43.2	42	45.7	N/A	49
Crit. 10	59	59.9	79.2	82.5	84	80.5	84	94.5	94.5	81.3	89.7	83.3	N/A	81